



ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT

IPA Cross-Border Cooperation Programme
Croatia – Serbia 2014-2020

STRATEGIC ENVIRONMENTAL IMPACT STUDY

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TERMS AND ACCRONYMS

CBC	Cross Border Cooperation
CP	Cooperation Programme
HR	Republic of Croatia
EC	European Commission
EU	European Union
EUSAIR	European Union Strategy for the Adriatic and Ionian Region
EUSDR	European Union Strategy for the Danube Region
IPA	Instrument for Pre-Accession Assistance
ICPDR	International Commission for the Protection of Danube River
MENP	Ministry of Environmental and Nature Protection
MRDEUF	Ministry of Regional Development and EU Funds
Programme area	Area targeted by interventions proposed in this cooperation programme
RS	Republic of Serbia
SEA	Strategic Environmental Assessment
SEA Directive	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.
SO	Specific objective

NON-TECHNICAL SUMMARY

Introduction

This SEA study is prepared for the IPA Cross-Border Cooperation Programme Croatia-Serbia for the period 2014-2020 that aims to strengthen the social, economic and territorial development of the cross-border area between Croatia and Serbia.

The programme has been prepared for an area covering four counties in the north-east of Croatia: Osječko-baranjska, Vukovarsko-srijemska, Brodsko-posavska and Požeško-slavonska county and five districts on north-west of Serbia: North Bačka, West Bačka, South Bačka, Srem and Mačva.

The programme has a total indicative budget of 34.293.188,00 EUR for the 2014-2020 period. With this budget and territorial focus, the cooperation programme focuses on four priority axes:

- **Priority Axis 1: Improving the quality of social and health services in the programme area (5.143.978,20 mil €)** with one Specific Objective:
 - *1.1 To improve facilities, services and skills in the area of health and social care*
- **Priority Axis 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency (9.602.092,64 €)** with two Specific Objectives:
 - *2.1 To improve management systems for risk prevention and environmental and biodiversity protection, and*
 - *2.2 To promote use of sustainable energy and energy efficiency.*
- **Priority Axis 3: Contributing to the development of tourism and preserving cultural and natural heritage (8.573.297,00 €)** with one Specific Objective:
 - *3.1 To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets*
- **Priority Axis 4: Enhancing competitiveness and developing business environment in the programme area (7.544.501,36 €)** with one Specific Objective
 - *4.1 To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area*

The programme will be implemented through various calls for proposals. Support to projects and ad-hoc application procedures and templates will be developed for each call for proposals. Calls for proposals might have different characteristics, i.e. they might be open to all programme priorities or thematically targeted in response to changed framework conditions in the area and/or taking into consideration the progress of the programme implementation. All these documents will be widely circulated and available from the programme and national websites.

Overview of key expected impacts of the proposed programme







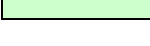
The design of the programme - its focus on cross-border cooperation, nature of eligible activities and a rather limited budget - allows to support activities that address some of the most urgent trans

Strategic Environmental Impact Study

boundary environmental problems. In addition to these positive impacts, the programme includes some proposals that - like any other development activities - pose some risks of adverse impacts on the environment. The expected impacts of the programme are shortly summarized in the matrix below:

Matrix of interactions between proposed Specific Objectives for each of the Priority Axes and their environmental implications		Climate change mitigation	Climate change adaptation	Air quality	Soil and agriculture	Water quality	Forests	Biodiversity	Ecological network	Cultural heritage	Public health	Waste and resource mgmt.
Priority Axis 1: Improving the quality of social and health services in the programme area (5.143.978,20 mil €)												
1.1	To improve facilities, services and skills in the area of health and social care											
Priority Axis 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency (9.602.092,64 €)												
2.1	To improve management systems for risk prevention and environmental and biodiversity protection											
2.2	To promote use of sustainable energy and energy efficiency.											
Priority Axis 3: Contributing to the development of tourism and preserving cultural and natural heritage (8.573.297,00 €)												
3.1	To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets											
Priority Axis 4: Enhancing competitiveness and developing business environment in the programme area (7.544.501,36 €)												
4.1	To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area											

Key:

	Likely significant impacts expected, impacts can be either positive or negative
	Potential impacts expected, impacts can be either positive or negative
	No significant impact expected
	Likely significant adverse impacts expected
	Potential adverse impacts expected
	Likely significant positive impacts expected
	Potential positive impacts expected

The following text summarizes the nature of the proposed interventions, their possible impacts and recommendations formulated within this SEA study.

Findings regarding Specific Objective 1.1.

The proposed programme's Specific Objective 1.1. '**To improve facilities, services and skills in the area of health and social care**' envisages that support will be provided to developing and implementing joint activities on enhancing the quality of health care and social care: e.g. joint health services delivery, active and healthy aging, disease prevention implementation plan, implementing joint strengthening of health care for vulnerable groups with focus on elderly, palliative care and persons with disabilities, networking of institutions in the area of enhancing health and social care facilities, services and skills, etc.

These interventions are expected to have minor positive impacts on public health. No adverse impacts are expected.

This SEA recommends that the following measures can be taken in order to enhance positive environmental impacts of the proposed interventions:

- a. Supported facilities for health and social services should be located in flood-safe areas and should be easily accessible in emergency situations (e.g. not be cut-off by floods).
- b. Development or modernization of buildings must meet all applicable environmental requirements and should ideally demonstrate good environmental building practices - e.g. easy accessibility for public transport, energy efficiency, sound waste collection, etc.

Findings regarding Specific Objective 2.1.

The proposed programme's Specific Objective 2.1. '**To improve management systems for risk prevention and environmental and biodiversity protection**' aim to support developing and implementing of especially joint initiatives for biodiversity protection and environmental management, risk prevention systems (floods and other hazards) and pilot and demonstration projects including innovative approaches to risk prevention and mitigation.

The proposed interventions under Specific Objective 2.1 include actions related to joint actions in the area of monitoring and management of environmental and/or biodiversity protection which are expected to have positive impacts without any risks of adverse impacts. In this regard, we only recommend that monitoring and management responses should focus specifically on priority issues addressed by the Danube River Basin Management Plan and the EU Strategy for the Danube Region (EUSDR) where more information is needed from the region: i.e. ecological and chemical status of water bodies, source of water pollution, ground-water pollution and accidental risk spots inventory, indigenous species (especially Danube sturgeon species), status of all species and habitats covered by EU nature legislation, and invasive species. Improvements of monitoring systems should primarily entail exchange of information and making it publicly available - new monitoring systems should be set up only when really needed. Monitoring system should be coordinated with bodies in charge of Danube River Basin Management Plan (i.e. ICPDR) - in terms of issues addressed, exact parameters monitored, using lessons from the Joint Danube Survey 3.

The character of proposed activities within IPA CBC Croatia-Serbia programme 2014-2020 also offers a suitable framework for supporting range of initiatives related to this cross-border Biosphere Reserve, especially on the Serbian side which awaits formal designation and where implementation

needs are extensive given the large area involved. In this regard, pay increased attention to possible support to activities related to this Biosphere Reserve as long as they fit into logic of programme interventions and they demonstrate additionality to any ongoing projects that may be funded from other sources (EU, international or national).

On the other hand, the Specific Objective 2.1 include actions related to risk prevention systems which may have both positive or adverse impacts on flooding, water quality and possibly also biodiversity - depending on the exact choice of measures to be supported. Our recommendations for actions related to emergency preparedness and risk prevention systems and small/scale investments for reducing or mitigating environmental problems and risks are as follows.

All supported activities on flood protection should promote a long-term flood protection and retention approach that respects the ecological processes in the flood plains. Priority attention should be given to actions that address the following six targets of the Action Programme for Sustainable Flood Protection in the Danube River Basin which follow the same logic and have been endorsed within the framework of the International Commission for Protection of Danube River (ICPDR).

Interventions on flood risks should be closely coordinated with Danube and Sava basin flood risk management plans and should also take into account potential impacts of climate change. Both of the proposed measures should ideally support implementation of Danube wide flood risk management plans due in 2015 under the Floods Directive. Alternately, should suitable application arise, priority consideration should be given to flood protection measures that can support implementation of priority measures endorsed through ICPDR's Sub-Basin Level Flood Action Plan for Pannonian Southern Danube (2009) - i.e.:

- Spatial planning (Preparation of flood risk maps, Ensuring that spatial plans contain flood hazard maps, Defining limitations related to land use in flood prone areas).
- Enhancing retention and detention capacities (Preserving - and where possible enhancing - existing capacities of natural flood retention capacities).
- Non-structural preventive measures: (Introducing principles of EU Floods directive to decision-making, Capacity building of professionals, Raising awareness and preparedness of general public (Raise awareness and preparedness of general public).

Lastly, we provide the following specific recommendations for actions related to pilot and demonstration projects including innovative approaches to risk prevention and mitigation that may have both positive and adverse impacts on environment and biodiversity:

- Supported measures must not restrict natural retention of flood plains - ideally should expand natural retention by e.g. promoting the 'room for river' approach that allows flooding during periods of high discharge.
- Consider adding establishment of protection forests amongst the types of eligible activities that can be supported.
- Flood prevention and drought protection projects should not be planned on locations where they will not have a negative impact on the Ecological Network target features or integrity.
- In case of support to irrigation, give preference to irrigation systems that do not require reservoir construction (especially not on the rivers) for their water source and that are not planned or already located within or in the vicinity of Ecological Network areas.

Findings regarding Specific Objective 2.2.

The proposed programme's Specific Objective 2.2. **'To promote use of sustainable energy and energy efficiency'** creates a funding framework for developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency, implementing awareness rising, information campaigns, education, training and capacity building on sustainable energy production, utilisation of renewable energy resources and energy efficiency and joint incentives in order to improve planning and/or legal framework in the area of renewable energy resources and energy efficiency (e.g. analyses, comparisons, recommendation, local/regional action plans, etc).

Although these interventions will have positive impacts on both climate change mitigation concerns (reductions in CO₂ emissions) and also adaptation concerns (adaptation to changing climatic conditions), there are several risks associated with their implementation. Renewable energy development may have - depending on the types of supported renewable energy options and their locations - adverse impacts especially on biodiversity, Natura 2000 network, water quality, landscape and cultural heritage.

In order to reduce these risks and enhance positive impacts of proposed activities, this SEA recommends that priority support within this Specific Objective should be given to:

- a. energy efficiency measures in public buildings (such as hospitals, schools - where possible synergies with interventions under Thematic Priority 1 Health and Social care services exist)
- b. use of agricultural waste for energy production,
- c. demonstration projects for solar power on roofs or build surfaces as long as they do not have adverse visual impacts on the landscape amenity.

We also recommend that:

- d. Supported projects must be subject to applicable environmental and health protection standards and be subject (when needed) to: environmental impacts assessments, assessments of impacts on Natura 2000 network and consultations on transboundary impacts (if such impacts would be expected).
- e. Wind turbines and large solar parks should not be planned within areas important for bird preservation (Special Protection Areas, SPA).
- f. Large solar parks and hydropower plants should not be planned within areas important for preservation of species and habitat types (Special Areas of Conservation, SAC)
- g. It is recommended to finance smaller-scale solar power projects (use of several panels, rather than large parks). Solar parks should be limited to already built urban areas.
- h. Any larger-scale promotion of biomass farming should be permitted only if it can be proved that it will not lead to the deterioration of already achieved state of any water body surface and groundwater (which is e.g. a fourth objective of Croatian River Basin Management Plan). Biomass farming should not be supported on vulnerable areas under Nitrate Directive, unless the such project applications prove that the choice of crops and farming practice will not increase fertilizers and pesticides loads.
- i. Targeted support can be provided to elaboration of renewable energy plans for counties in the study area and their optimizing through SEA processes. Such plans may be helpful for guiding preparations of specific investment projects and they can simplify environmental permitting processes (if SEA is done well). Such plans, can also consider any possible transboundary impacts.

Findings regarding Specific Objective 3.1.

The proposed programme's Specific Objective 3.1. 'To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets' envisages that support will be provided to e.g. joint development, branding and promotion of tourism niches; development and diversification of the tourism offer and capacity; improvement of recreational and small-scale tourism infrastructure; developing and implementing joint initiatives on valuation, preservation, restoration and revitalisation of cultural and natural heritage sites; implementing training programs in quality assurance systems and different types of standardisation (e.g. ISO certification, etc.) of cultural and natural heritage; equipment supply and also small scale infrastructure on cultural and natural heritage, etc.

Proposed interventions related to development and diversification of the tourism offer and capacity; improvement of recreational and small-scale tourism infrastructure may have some local impacts on biodiversity and Natura 2000 network with possible minor local impacts on water quality, landscape and cultural heritage. Our recommended measures for reducing risks of adverse impacts and enhancing positive environmental impacts of these interventions are:

- a. Ensure in the project preparatory phase, that no important and protected habitats and species (target features) are endangered by the planned infrastructure and activities.
- b. Preparation and development of joint tourism strategies and action plans should be subject to strategic environmental assessments (when their potential impacts would merit so).

It is recommended to consider prioritizing eco/agro-tourism projects that contribute to sustainable management of protected areas (e.g. walking and cycling paths, renovation of visitor centres, etc.) that have been prepared in cooperation with nature protection and culture protection authorities and adhere to the principles of EU Agenda for a sustainable and competitive European tourism such as: taking a holistic, integrated approach; planning for the long term; involving all stakeholders; recognizing, minimising and monitoring risks.

Proposed interventions related to preservation, restoration and revitalisation of cultural and natural heritage sites are expected to bring positive impacts on cultural heritage and also possibly on natural heritage sites. However, inappropriate implementation of these activities poses a risk of unintended adverse impacts on tangible and intangible attributes of heritage sites and on nature heritage sites.

The following measures can be taken in order to enhance positive environmental impacts of the proposed interventions:

- a. Ensure in the project preparatory phase, that no important and protected habitats and species (target features) are endangered by the planned infrastructure and activities.
- b. The supported projects must meet all applicable national rules for cultural heritage protection.
- c. It is also recommended to inform prospective applicants about the following principles that should guide their planning of interventions for sustainable use of cultural and natural heritage:
 - Conservation plans must contribute to the authenticity and integrity of the sites and monuments and their tangible and intangible elements.
 - Conservation plans must address all relevant factors necessary for adequate long-term safeguarding and sustainable use of the heritage site or monument.
 - The principal objectives of the conservation plans should be clearly stated. The proposals in the conservation plan must be articulated in a realistic fashion, from the legislative, financial and economic point of view, as well as with regard to the required standards and restrictions.
 - The conservation plans should aim at ensuring a harmonious relationship between the heritage sites and monuments and the surrounding environment as a whole. Wherever

necessary for the proper protection of the property, an adequate buffer zone should be provided.

- New functions and activities should be compatible with the character of the heritage sites and monuments. Proponents must ensure that such changes do not impact adversely on the outstanding value of the heritage site or monument.
- Before any intervention, existing conditions in the area should be thoroughly documented.
- Conservation planning should therefore encourage the active participation of the communities and stakeholders concerned with the property as necessary conditions to its sustainable protection, conservation, management and presentation.

Findings regarding Specific Objective 4.1.

The proposed programme's Specific Objective 4.1 **'To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area'** will offer funding for strengthening capacities of the business support institutions in order to enhance competitiveness of the programme area through e.g.: development of e-business and e-trade; establishment of and support to existing and new business related sectorial networks and organisations in developing new products/services/patents/trademarks, standardisation, product protection, marketing and development of cross-border markets, developing and strengthening cooperation between public sector, education, research & development organisations and entrepreneurs in order to improve competitiveness by applying business innovativeness based on smart specialization approach; and cross-border development, adaptation and exchange of best practices in application of new technologies, processes, products or services to be directly used by the enterprises between the clusters or groups of business, R&D and education institutions, etc.

These interventions are not expected to have any significant impacts on the environment. In order to enhance their potential positive environmental impacts, we recommend to prioritize support - if suitable applications for programme support arise - to business clusters that address opportunities arising from:

- producing and marketing organic agriculture products,
- waste management and waste reuse (e.g. waste from electronic equipment),
- water efficiency and water conservation systems;
- water-efficient irrigation systems;
- drought-resistant and other climate-resilient crops, etc.

Alternatives considered, uncertainties and the need for environmental monitoring

This SEA study has focused on the two alternatives - 'do nothing' and 'proposed programme'. Information provided within Chapters 5 and 6 of this study outline the expected impacts of proposed programme as compared with 'do nothing' option. The SEA was conducted in ex-ante manner during final 4 months of the programme elaboration. Within this context, the assessment aimed to identify possible problems and measures during the formulation of the programme itself - and indeed, several recommendations, especially those related to Priority Axis 2 were directly incorporated into the proposed version of the cooperation programme. In this regard, the Managing Authority and the programming team strived to optimize the cooperation programme so that it does not pose - on the level of the programme itself - any risks to environment and maximizes

opportunities for achieving positive impacts on the environment. The recommendations provided within this SEA study should be treated as additional detailed safeguards to ensure that this happens.

The assessment itself has not been constrained by any difficulties, except facing the usual challenge of having no information about the exact features and locations of future activities that will be actually supported during the implementation of the cooperation programme. The assessment therefore considered the likely possible scenarios of possible implementation without being speculative (by e.g. considering extreme hypothetical options). Other than these usual challenges, there were no constraints in the SEA process and the conclusions made are not bound by any significant uncertainties.

Due to the absence of significant risks and uncertainties on the programme-wide level, the SEA study concluded that there is no need for dedicated environmental monitoring system for the proposed IPA CBC programme Croatia-Serbia 2014-2020.

However, joint environmental management initiatives under the programme Specific Objective 2.1 may provide useful data on biodiversity protection, water quality, flood risks and related hazards. Any proposals for monitoring systems should be therefore consulted with the relevant national authorities in order to maximise potential synergies with higher-level monitoring systems.

Feedback sought

This SEA study is made available for public comments. Relevant authorities and the public can provide comments on any matters that they deem relevant.

The Managing Authority for the IPA Cross-Border-Cooperation Programme Croatia-Serbia 2014-2020 and the authors of this SEA study will appreciate feedback on especially the following questions:

- 1. Does this SEA study address all main strategic environmental concerns which are relevant to the proposed programme – considering its focus and nature of the proposed interventions?**
- 2. Does the analysis of the baseline and impact assessment correctly capture key environmental risks, opportunities and other issues of strategic importance – and if not, what changes should be made?**
- 3. Do the proposed mitigation and enhancement measures suggest realistic and cost-effective arrangements for reducing the risks and/or for enhancing environmental benefits of the proposed programme – and if not, what changes should be made?**

Should you wish to obtain any clarifications or directly discuss any matters relevant to this SEA with the authors of this SEA study, please contact:

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1 INTRODUCTION TO CROATIA-SERBIA IPA CROSS-BORDER COOPERATION PROGRAMME 2014-2020

This SEA study is prepared for the Croatia-Serbia IPA Cross-Border-Cooperation Programme for period 2014-2020 (hereafter cooperation programme). This chapter presents the main objectives of the proposed cooperation programme and its relationships with the relevant higher-level EU strategies.

1.1 Outline of the programme

The overall objective of the cooperation programme is to strengthen the social, economic and territorial development of the cross-border area between Croatia and Serbia.

The programme area - illustrated on the Figure 1 below - consists of four counties in the north-east of Croatia: Osječko-baranjska, Vukovarsko-srijemska, Brodsko-posavska and Požeško-slavonska county and five districts on north-west of Serbia: North Bačka, West Bačka, South Bačka, Srem and Mačvanski district.

Figure 1 Map of programme area



Source: Draft IPA Cross-Border Cooperation Programme Croatia-Serbia 2014-2020

Within this area, the cooperation programme focuses on four thematic priorities :

1. Health and social services
2. Environment, biodiversity, risk prevention, sustainable energy and energy efficiency
3. Tourism and cultural and natural heritage

4. Competitiveness and business environment development

The total funding value of the of the cooperation programme is 34.293.188,00 EUR for the 2014-2020 period. The programme is expected to reach the following objectives and results within each of its Priority Axes.

Table 1: Priority Axes, Specific Objectives and Expected Results of the HR-RS IPA CBC Programme 2014-2020

Priority Axes of the Cooperation Programme	Specific Objectives of Priority Axes	Expected Results
Priority Axis 1: Improving the quality of social and health services in the programme area (5.143.978,20 mil €)	1.1 To improve facilities, services and skills in the area of health and social care	Improved quality of the facilities, services and skills in the area of health and social care
Priority Axis 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency (9.602.092,64 €)	2.1.To improve management systems for risk prevention and environmental and biodiversity protection	Enforced management for prevention of natural disasters, mined-areas and environmental and biodiversity protection.
	2.2To promote use of sustainable energy and energy efficiency.	Increased capacities for development of sustainable energy and energy efficiency.
Priority Axis 3: Contributing to the development of tourism and preserving cultural and natural heritage (8.573.297,00 €)	3.1 To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets	Strengthened, diversified, better integrated cross-border tourism offer and better managed cultural and natural heritage assets
Priority Axis 4: Enhancing competitiveness and developing business environment in the programme area (7.544.501,36 €)	4.1 To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area	Increased competitiveness in the programme area.

The cooperation programme will be implemented through selection of applications for projects support made in various calls. Calls for proposals might have different characteristics, i.e. they might be open to all programme priorities or thematically targeted in response to changed framework conditions in the area and/or taking into consideration the progress of the programme implementation (also as follow-up of the independent programme evaluation).

1.2 Types of actions to be supported within the programme

The managing authority for the programme will prepare information about the application and selection process and will make it available to potential applicants in call-specific application documents. The programme envisages that ad-hoc application procedures and templates will be developed according to the specific characteristics of each call for proposals. The information and application package will include the necessary guidance to assist partnerships in the preparation of their application. All these documents will be widely circulated and available from the programme and national websites.

The programme foresees that the following types of actions will be supported under its various specific objectives.

Specific Objective 1.1. **‘To improve facilities, services and skills in the area of health and social care’** envisages that support will be provided to the following types of actions:

- Developing and implementing joint cross-border lifelong learning/training programmes aiming to provide programme area inhabitants the possibility to gain knowledge / experiences / qualifications in the area of health and social care line with the labour market needs.
- Developing and implementing joint cross-border initiatives and/or related pilot projects aiming to enhance the quality, improve accessibility to and effectiveness of public health care and social services and institutions (e.g. joint health services delivery, active and healthy aging, disease prevention implementation plan, small infrastructure and/or equipment) .
- Implementing ICT solutions in order to improve public health and social care services
- Implementing joint cross-border strengthening of health care for vulnerable groups with focus on elderly people, palliative care and persons with disabilities.

Specific Objective 2.1. **‘To improve management systems for risk prevention and environmental and biodiversity protection’** plans to support the following types of actions:

- Implementing joint actions in the area of monitoring and management of environmental and/or biodiversity protection
- Developing and implementing integrated risk management initiatives addressing key existing and expected risks in the programme area (floods, flushing of land mines during flood events, draughts, toxic pollution accidents, etc).
- Developing and implementing pilot and demonstration projects including innovative approaches to risk prevention and mitigation.
- Developing and implementing joint plans for protection of endangered species and protection and revitalisation of habitats.
- Joint valorisation and promotion of ecosystems and NATURA 2000 sites in the programme area
- Developing and implementing joint awareness raising activities, information campaigns, education and training in relation to environment and/or biodiversity protection.
- Promoting cross-border cooperation between organisations involved in environmental and biodiversity protection and joint management of protected sites and nature
- Establishing and/or improving green infrastructure and ecosystem services

Specific Objective 2.2. **‘To promote use of sustainable energy and energy efficiency’** creates a funding framework for the following types of actions with cross-border elements:

- Developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency.

- Implementing awareness rising, information campaigns, education, training and capacity building on sustainable energy production, utilisation of renewable energy resources and energy efficiency.
- Investing in joint infrastructure on sustainable energy and energy efficiency
- Developing and implementing actions aiming to increase energy efficiency in public infrastructures
- Implementing joint incentives in order to improve planning and/or legal framework in the area of renewable energy resources and energy efficiency (e.g. analyses, comparisons, recommendation, local/regional action plans, etc).

Specific Objective 3.1. 'To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets' envisages that support will be provided to the following types of actions:

- Joint development, branding and promotion of tourism niches: e.g. hunting, bird and animal watching, cultural tourism, eco-tourism, sport and cycle-tourism, wine & food tourism, health and wellness, rural tourism, recreation tourism, memorial tourism, nautical tourism, religious tourism, industrial heritage tourism.
- Joint development and diversification of the tourism offer and capacity: e.g. standardisation of accommodation support, joint mapping the tourism offer, joint creation of destination management platforms and networks.
- Joint development, branding, protection and promotion of new tourism products: e.g. development of thematic routes, joint promotion events and materials, site exploitation.
- Improvement of recreational and small-scale tourism infrastructure: e.g. walking paths, cycle routes, equipping visitor centre, information points, networking tourism centres, spatial "beautification".
- Preparing and developing joint tourism strategies and action plans.
- Implementing training and other activities aiming to develop the tourism capacity and destination management skills
- Implementing cross-border networking activities, including establishing or improving clusters aiming at developing joint cross-border tourism offer
- Enabling joint cultural cooperation between youth, artistic and cultural organisations: e.g. art colonies and festivals, artistic manifestations and events, joint theatre performances or joint/traveling exhibitions, etc.
- Developing and implementing joint initiatives on valuation, preservation, restoration and revitalisation of cultural and natural heritage sites
- Implementing training programs in quality assurance systems and different types of standardisation (e.g. ISO certification, etc.) of cultural and natural heritage.
- Deploying investments in certification including training, equipment supply but also small scale infrastructure on cultural and natural heritage.

Specific Objective 4.1 'To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area' will offer funding for the following types of actions:

- Development of training programmes aiming at improving knowledge and skills in entrepreneurship, applying innovation and new technologies in their industry, including cross-border internship, exchange and transfer of knowledge
- Strengthening capacities of the business support institutions in order to enhance competitiveness of the programme area through development of e-business and e-trade

- Establishment of and support to existing and new business related sectorial networks and organisations in developing new products/services/patents/trademarks, standardisation, product protection, marketing and development of cross-border markets.
- Establishing and supporting development agencies, technological and competence centres, laboratories and ICT infrastructure for common use of the enterprises in the programme area in order to upgrade the existing and develop new products, services, processes or prototypes.
- Developing and strengthening cooperation between public sector, education, research & development organisations and entrepreneurs in order to improve competitiveness by applying business innovativeness based on smart specialization approach.
- Cross-border development, adaptation and exchange of best practices in application of new technologies, processes, products or services to be directly used by the enterprises between the clusters or groups of business, R&D and education institutions.

1.3 Relationship of the proposed cooperation programme with other relevant plans and programmes

The main aim of EU-funded cross border cooperation programmes is to reduce the negative effects of borders as administrative, legal and physical barriers, tackle common problems and exploit untapped potential.

CBC programmes are cooperation mechanisms which do not directly influence any lower level plans - such regional or local spatial plans in the respective programme area. Through joint management of programmes and projects, mutual trust and understanding are strengthened and the cooperation between participating countries is enhanced.

The main added value of cross-border cooperation and helps better address similar threats as well as promote more balanced development. In this regard, Croatia-Serbia IPA CBC Programme 2014 - 2020 has important relationship to two macro-regional strategies that the European Union have devised that have bearing to this cooperation programme:

- European Union Strategy for Danube Region
- European Union Strategy for the Adriatic and Ionian Region

These macro-regional strategies offer an endorsed integrated framework for addressing common challenges and suggest actions of common interest that may be supported by the European Structural and Investment Funds among others. The key features of these strategies are shortly summarized below.

European Union Strategy for Danube Region

The EU Strategy for the Danube Region (EUSDR) provides an overall framework for parts of Central and South East Europe area aiming at fostering integration and integrative development. The Danube Region covers 14 countries (Germany, Austria, the Slovak Republic, the Czech Republic, Hungary, Slovenia, Romania, Bulgaria Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Republic of Moldova and Ukraine). Thus, the Danube Region encompasses the entire programme area.

The EU Strategy for the Danube Region was adopted through European Commission communication¹ in December 2010. The strategy includes four pillars:

- Connecting the Danube Region,

¹ COM(2010) 715

- Protecting the environment in the Danube Region,
- Building prosperity in the Danube Region and
- Strengthening the Danube Region.

EU Strategy for Danube Region addresses environmental protection matters related to the study area. The key environmental reference framework for the proposed Croatia-Serbia IPA CBC Programme 2014 - 2020 are the priorities defined in the environmental pillar of the EU Strategy for the Danube Region. EUSDR environmental pillar focuses on three Priority Areas which have to be integrated with other policies:

- Restore and maintain the quality of waters;
- Manage environmental risks;
- Preserve biodiversity, landscapes and the quality of air and soil.

The above priority areas have several specific objectives that will be used as the primary environmental policy objectives which are relevant for the programme.

European Union Strategy for the Adriatic and Ionian Region

In June 2014, the European Commission adopted communication concerning the European Union Strategy for the Adriatic and Ionian Region² (EUSAIR) provides a framework for a coherent macro-regional strategy and Action Plan that aims to promote sustainable economic and social prosperity in the Adriatic and Ionian Region through growth and jobs creation, and by improving its attractiveness, competitiveness and connectivity, while preserving the environment and ensuring healthy and balanced marine and coastal ecosystems. The strategy is based on the following four pillars:

1. Blue Growth aimed to drive innovative maritime and marine growth in the Region by promoting sustainable economic development and jobs and business opportunities in the Blue economy, including fisheries and aquaculture.
2. Connecting the Region aimed to improve transport and energy connectivity in the Region and with the rest of Europe through Inter-linked and sustainable transport and energy networks
3. Environmental Quality aimed to address environmental quality through cooperation at the level of the Region.
4. Sustainable Tourism aimed to develop the full potential of the Region in terms of innovative, sustainable, responsible quality tourism

The Strategy recognizes climate change mitigation and adaptation as well as disaster risk management as two horizontal issues of concern that should be addressed in all four pillars. Furthermore, it also identifies two cross-cutting aspects: capacity-building, including communication, for efficient implementation and for raising public awareness and support; and research and innovation to boost high-skilled employment, growth and competitiveness as important tools for addressing aims of the Strategy.

² COM(2014) 357 final

2 SCOPE OF THIS STRATEGIC ENVIRONMENTAL ASSESSMENT STUDY

This chapter presents scope of the SEA study. It outlines key environmental issues of interest which are relevant to the proposed programme, comments obtained during scoping, assessment approach, alternatives considered and uncertainties and limitations that constrained this study.

2.1 Key environmental issues of interest relevant to the proposed programme

As earlier noted in section 1.1 of this SEA study, the proposed programme is primarily designed to implement a range of smaller activities that facilitate cross-border cooperation. The cooperation programme will be implemented through series of call for proposals that address development interventions and desired outcomes outline above. While the cooperation programme specifies the nature of proposed interventions by outlining the eligible activities, it does not specify the location and exact nature of projects that will be supported. Budget for the proposed activities makes it clear that the programme will not allow implementation of larger infrastructural projects.

While the cooperation programme specifies the nature of proposed interventions by outlining the eligible activities, it does not specify the location and exact nature of projects that will be supported. The nature of the programme hence does not allow to address local and specific environmental impacts of future interventions that will be supported within the programme implementation. It does allow to analyze consistency of proposed interventions with the relevant environmental protection objectives established at higher-level strategies which are relevant for the programme area and also the general environmental risks associated with proposed interventions.

The Table 2 offers an overview of possible substantive linkages between proposed interventions, typical EU environmental policy targets that are relevant for the proposed interventions and possible environmental risks


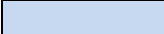




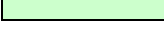
Table 2: Interactions between the proposed cooperation programme and environmental protection policy concerns

Environmental issues	Environmental protection objectives of EUSDR, EUSAIR and Europe 2020 strategy	Thematic Priority 1	Thematic Priority 2		Thematic Priority 4	Thematic Priority 7
		SO 1.1	SO 2.1	SO 2.2	SO 4.1	SO 7.1
Biodiversity	Protect and improve conditions and functions of ecosystems and their connectivity	-				-
	Preserve the natural diversity of fauna, flora	-				-
Climate change	Decrease emissions causing climate change	-	-		-	-
	Facilitate adaptation to the climate change	-			-	-
Water	Limit water pollution from point and diffuse sources (including accidents)	-			-	-
	Decrease the risks of flooding in line with the EU Floods Directive	-		-	-	-

Strategic Environmental Impact Study

Environmental issues	Environmental protection objectives of EUSDR, EUSAIR and Europe 2020 strategy	Thematic Priority 1	Thematic Priority 2		Thematic Priority 4	Thematic Priority 7
		SO 1.1	SO 2.1	SO 2.2	SO 4.1	SO 7.1
Soil	Limit point and diffused sources of soil pollution	-			-	-
Air	Maintain and improve the quality of ambient air within the limits set by the legal norms	-	-		-	-
Public health	Improving determinants of health		-	-	-	-
	Reduce environmental-health risks	-		-	-	-
Sustainable resource mgmt	Limit use of depleting natural resources	-	-	-	-	
	Reduce waste generation, increase waste recovery, and facilitate recycling of all waste	-	-		-	
Cultural heritage and landscape	Protection of natural and cultural landscape	-	-		-	-
	Protect cultural heritage	-	-	-		-

Key:

	Potentially significant impacts expected, impacts can be either positive or negative
	Potential impacts expected, impacts can be either positive or negative
	No significant impact expected
	Potentially significant adverse impacts expected
	Potential adverse impacts expected
	Potentially significant positive impacts expected
	Potential positive impacts expected

As evident above, of specific interest within the interventions proposed is the Thematic Priority 2 with its specific objective: 2.1. To improve management systems for risk prevention and environmental and biodiversity protection which is likely to achieve many positive effects but it may pose risks of adverse impacts on biodiversity and natural flood passage capacity. This intervention will receive increased attention.

Thematic Priority 2 specific objective 2.2: To promote sustainable use of energy and to strengthen energy efficiency is likely to achieve overall positive environmental effects but it may also pose potential environmental risks, especially those related to biodiversity, landscape, and possibly air quality and waste management.

The Thematic Priority 4: Tourism and Cultural and Natural Heritage is expected to have positive impacts on cultural heritage but may lead to adverse impacts on biodiversity and natural and cultural landscape.

The Thematic Priority 7: Competitiveness and business environment development may very theoretically have some impacts on the natural resources use and waste generation, recycling and recovery.

The thematic Priority 1: Health and Social care services is designed to achieve positive impacts on public health and will not expected to have any significant adverse impacts on the environment.

2.2 Inputs obtained through consultations on the scoping report

Based on the initial review of the proposed cooperation programme, a question arose as to whether the proposed interventions may lead to significant impacts that could not be managed through more detailed studies on project-level (such as EIA, or standard types of permits related to environmental matters that are already in place in Croatia and Serbia) and whether SEA is actually needed. In this regard, it was proposed to undertake a simplified form of SEA and focus it on providing suggestions for detailed planning of each of the intervention in order to reduce possible risks and maximize their environmental benefits.

The proposed interventions were described in the scoping report which was sent to relevant authorities in Croatia and Serbia on 21 August 2014 and made available for 30 days of public commenting through the website of the Managing Authority for the cooperation programme³. The Managing Authority also held a scoping meeting on 12 September 2014 in Zagreb at the premises of Ministry of Regional Development and EU Funds of the Republic of Croatia.

The period of scoping consultations finished on 22 September 2014. The table below presents inputs that came during this consultation and the way the recommendations and requests obtained have been taken into account within this SEA.

Table 3: Inputs obtained during scoping consultations and response by the SEA team

Institution and response regarding the scope of the SEA	Response by the SEA team
<p>Republic of Croatia, Ministry of Culture</p> <p>Requires to address relationship to the cultural heritage. The contents of the study related to the cultural heritage should be:</p> <ul style="list-style-type: none"> starting points and methodological approach with regard to cultural heritage analysis of conditions of cultural heritage on which the implementation of the programme could have a significant effect verification of implementation of the cultural heritage protection objectives which arise from international conventions and charters signed by the Republic of Croatia analysis and presentation of likely significant impacts of the programme on 	<p>With regard to assessment methodology, the SEA faced the generic nature of the proposed cooperation programme and lack of details of future activities that will be implemented within its framework (what, where and how). These features of the proposed programme did not permit us to assess impacts of development interventions on specific cultural heritage sites through project-level (EIA-based) approaches that are e.g. promoted within ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011) which advocates for a holistic assessment of cumulative effects of various impacts on key attributes of cultural heritage properties.</p> <p>Our methodology was guided by conclusions of session on Cultural Heritage held within the 2008</p>

³ <http://www.mrrfeu.hr/default.aspx?id=4243>

<p>cultural heritage</p> <ul style="list-style-type: none"> measures to protect cultural heritage, including measures to prevent, reduce mitigate or compensate potential impacts on cultural heritage and proposal for a solution most convenient for cultural heritage description of envisaged measures for monitoring the status of cultural heritage <p>It was recommended that the SEA includes appropriate cartogram representations of cultural heritage in relation to the planned programme.</p>	<p>Annual Conference of International Association for Impact assessment that formulated the following recommendations related to treatment of cultural heritage concerns within SEA⁴:</p> <ol style="list-style-type: none"> The concern for both tangible (i.e., material culture) and intangible (i.e., customs, and cultural expression) elements in assessing cultural heritage within SEA and EIA The attention to cultural landscapes and cityscapes as defined areas for assessment The increasing concern for stakeholder identification and negotiated solutions, especially including local populations and indigenous peoples <p>We have raised these concerns in our impact assessment and during formulation of our recommendations for future planning processes with regard to possible impacts. These proposals also reflect suggestions stipulated in the relevant international treaties and guidance⁵ in order to guide planning of interventions for sustainable use of cultural and natural heritage. For details, see section 5.8 of this SEA study.</p> <p>The generic nature of proposals contained in the cooperation programme did not allow identify any direct relationships between the proposed cooperation programme and the international conventions and charters signed by the Republic of Croatia per se. We were however able to analyse relationship to the Strategy of Conservation, Protection and Sustainable Economic Use of the Cultural Heritage of Croatia which are presumably aligned with the relevant international commitments by the Republic of Croatia.</p> <p>The cartogram representing cultural heritage in relation to the planned programme was not prepared as it was not needed the assessment approach chosen and the nature of interventions proposed.</p>
<p>Republic of Croatia, Ministry of Agriculture</p>	<p>With regard to water management, the SEA addressed the comments obtained within the</p>

⁴ <https://www.iaia.org/IAIA08Perth/cs/session.aspx?id=CS2.9&ts=6>

⁵ World Heritage Convention (1972), Operational Guidelines for the Implementation of the World Heritage Convention (2013), International Charter for the Conservation and Restoration of Monuments and Sites (1964), Charter for the Conservation of Historic Towns and Urban Areas (1987), International Cultural Tourism Charter (1999), The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas (2011)

<p>1. Directorate for Water Management has given only general guidance on what is needed to be considered in the SEA Report:</p> <ul style="list-style-type: none"> • compliance with relevant strategies and plans of the water management issues, such as Water Management Strategy, River Basin Management Plan, Draft Long-Term Programme for Construction of Water Regulation and Protection Structures and Amelioration Structures • compliance with relevant water management legal framework. <p>In doing so the following principles must be observed:</p> <ul style="list-style-type: none"> • negative impacts on surface water and groundwater condition in accordance with Water Framework Directive should be analysed • sustainable use of water based on long term protection of available water resources should be promoted • impacts of climate changes in respect to flood and drought mitigation should be analysed <p>It pointed out the importance of ensuring water protection and good water status due to sustainable management and use of water. SEA Report should identify whether any proposed activity is in conflict with measures for obtaining water management objectives prescribed by relevant water management legal framework. Also, it is especially important to take into account the constraints related to development in areas of special protection of waters.</p> <p>2. Directorate for forestry, hunting and wood production requested that description of forest ecosystems in the programme area, as well as assessment of possible impacts on forest is included in SEA Report especially due to implementation of activities under PA 2 and PA</p> <p>3. Directorate for agriculture and food industry had no comments.</p>	<p>baseline analyses (sections 3.2-3.4) and within assessment of impacts related to climate change adaptation and risk management (section 5.2) and water quality (section 5.5.)</p> <p>The proposed programme does not have any strong direct relationship - neither conflicting nor synergistic - with objectives and measures prescribed within Croatian River Basin Management Plan (OG 82/13) and Water Management Strategy (OG 91/08). It also does not include any proposed activity which would be in conflict with measures for obtaining water management objectives .</p> <p>The programme is not likely to have any significant effects on forests and forestry. Information related to management of forests are addressed in baseline analyses (section 3.5) and impact assessment (section 5.6).</p>
<p>Republic of Croatia, Ministry of Social Policy and Youth Points out that activities in the Priority Axes</p>	<p>SEA team agrees that the expected impacts of interventions in health services would not have significant impacts on the environment. However,</p>

addressing employment, social inclusions, health and social services are not expected to have significant effects on the environment and do not need to be included in the SEA	they were eventually addressed during the assessment as some opportunities for synergies with interventions related to energy and environment (Priority Axis 2) were found.
Republic of Croatia, Ministry of Environmental and Nature Protection No substantive comments to the scoping report - only pointing out the need to correct the study area.	Noted and implemented.
Republic of Croatia, Ministry of Entrepreneurship and Crafts No comments	Noted
Republic of Croatia, Ministry of Tourism No comments	Noted.
Republic of Croatia, Ministry of Economy No comments	Noted.

2.3 Alternatives considered and analytical approach used in this SEA

The SEA process has been undertaken during June-September 2014 and has been integrated into the preparation of Versions 4 and 5 of the proposed cooperation programme. This choice was natural since the programming process was open and allowed changes to be made through various inputs obtained.

The SEA has focused on two alternatives - 'do nothing' and 'proposed programme'. Information provided within Chapter 5 and Chapter 6 of this study outline the expected impacts of proposed programme as compared with 'do nothing' option. The assessment itself focused on three core questions:

Core SEA questions	Relevant parts of the SEA study
Question 1: What are the key cross-border or transboundary environmental issues of concern (management of shared natural resources, existing transboundary environmental problems and arising risks) in the programme area?	Addressed in the Chapter 3 which examines key issues of interest.
Question 2: How does the cooperation programme relate to international priorities for managing transboundary environmental risks and advancing sustainable use of shared natural resources in the programme area?	Mainly done through appraisal of the proposed programmes against targets defined in the environmental pillar of the EU Strategy for the Adriatic and Ionian region (see Chapter 4), with additional suggestions generated through assessment of impacts on environment (Chapter 5).

<p>Question 3: Do the proposed interventions pose any specific risks that cannot be effectively addressed within decision-making on the specific projects that will be developed during programme implementation? If so, how can these be addressed within the proposed cooperation programme itself?</p>	<p>Assessment of the likely expected impacts of the programme on the environment (Chapter 5) and on Natura 2000 network (Chapter 6) generated information on potential impacts and possible measures that could be taken for addressing the identified risks.</p>
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Throughout the SEA process, the Managing Authority and the programming team strived to optimize the proposed interventions based on the inputs by the SEA team. Indeed, many suggestions provided by the SEA team, especially those related to Priority Axis 2, were directly incorporated into the final version of the cooperation programme. In this regard, recommendations provided within this SEA study should be treated as additional detailed safeguards for implementation of the programme that aim to avoid any risks to environment and maximize that opportunities for achieving positive impacts.

2.4 Difficulties and uncertainties

The assessment itself has not been constrained by any difficulties. However the general nature of proposed interventions and lack of information about their possible future locations - that are actually the inevitable features any cooperation programme - led to the need to envisage possible situations which may occur during the implementation of the proposed interventions. When doing so, the assessment considered the likely possible scenarios of possible implementation without being speculative (by e.g. considering extreme hypothetical options). The SEA described the various assumptions and key features of identified impacts and immediately suggested possible measures that can be taken to prevent or reduce the potential adverse impacts and enhance the positive impacts.

Other than these usual challenges, there were no constraints in the SEA process and the conclusions made are not bound by any significant uncertainties.

3 ENVIRONMENTAL BASELINE CONDITIONS

This chapter outlines the environmental characteristics of the programme areas, the relevant aspects of the current state of this environment and its likely evolution without implementation of the programme and the existing environmental problems which are relevant to the proposed programme. The baseline analysis has been structured in the following sequence in order to cluster issues with possible mutual linkages:

- Climate and climate change
- Flood risks
- Water quality

- Biodiversity, fauna, flora
- Forests and forestry

- Soil
- Air quality
- Hazardous waste and pollution hotspots

- Cultural heritage

Information provided in this chapter has been collected also with an aim to provide a comprehensive information on the environmental status, trends and key issues of concern in the programme area so that it can be used during implementation of the proposed CBC programme or in its future revisions.

3.1 Climate and climate change

According to Köppen classification, the programme area belongs to cfwb"x" climate zone - i.e. it features a temperately warm and rainy climate, without dry periods. The average year temperature for a 30 year period (1961-1990), as measured by the climatological station of Požega, is 10.6 oC and year precipitation quantity is 782 mm. Precipitation evenly distributed throughout the year, the driest period being in winter. The major part of the Pannonian Plain receives most rain in late spring, most often in May and June. The secondary precipitation maximum is in February, whilst October is the driest month in this area.

Climate change trends projected for the Croatian part of the programme area

Meteorological data has been taken from several stations in Croatia since the 19th century allow for a reliable documentation of long-term climatic trends. CroAdapt project⁶ summarizes the key climatic trends presented in the Fifth National Communication of the Republic of Croatia under the United Nation Framework Convention on the Climate Change⁷ as follows:

- All across the country, rising average temperatures were indicated, especially pronounced during the last 20 years. The positive temperature trends in the continental parts of Croatia are mainly

⁶ http://www.bef-de.org/fileadmin/files/Our_Topics/Energy/CroAdapt/CroAdapt_CountryBrief.pdf, , last accessed on 25 Sept 2014

⁷ http://unfccc.int/resource/docs/natc/hrv_nc5.pdf, last accessed on 25 Sept 2014

due to winter trends, while those on the Adriatic coast can mainly be attributed to summer trends.

- There has been a trend of slightly declining rates of annual precipitation during the 20th, continuing at the beginning of the 21st century, and an increase in the number of dry days all over Croatia. Also the frequency of dry spells, i.e. the number of consecutive dry days, has risen.

Projections of temperature increase for Croatia have been calculated for 2041-2070 compared with 1961-1990 (A2 scenario) to increase mainly in summer (2°C in the northern part of the country) and winter (1.8°C in the northern part of the country), with spring and autumn being expected to have: relatively uniform warming of about 1.5°C throughout the larger portion of the continental Croatia. In many areas, however, the number of hot days with maximum temperatures higher or equal to 30°C, is expected to be doubled by the middle of this century.

With regard to precipitation, the expected decrease is generally less than 0.5 mm/day (or 45 mm in a season). The western and southern Croatia are expected to receive a deficit in precipitation, while the increase in winter is not reliable. In northern parts of the country there will be no significant change in total precipitation in future climate.

Climate change trends relevant for the Serbian part of the programme area⁸

A review of the climate change in Serbia given in the Serbia's First National Communication indicate that observed mean annual temperatures in the last 50 years show an upward trend in almost all of Serbia. An increase of 0.04°C per year is evident, while in some areas in eastern and southeastern parts of the country a downward trend up to -0.05°C per year has been recorded. The highest increase in temperature has been observed in autumn season.

The rainfall amount observed in the period 1946-2006 has had an upward trend in most parts of the territory of Serbia. However, a decrease in rainfall amounts has been recorded in eastern and southeastern parts of Serbia.

Assessment of expected climate change obtained by regional climate model integrations show that further annual mean temperature increase can be expected. According to A1B scenario, increase in temperature over the territory of Republic of Serbia for the period 2001-2030 is from 0.8 to 1.1°C, whilst in case of A2 scenario this increase for the period 2071-2100 is from 3.4 to 3.8°C. Climate projections for the periods 2001 to 2030 (SRES A1B scenario) and 2071 to 2100 (A2 scenario), indicate an increase of precipitation for Serbia of 20 to 30 mm/year for 2001 - 2030 and a decrease of precipitation of up to 30 mm/year for 2071 - 2100, compared with 1961 - 1990.

Interestingly, the current state of climate change in Vojvodina features noticeable increased number of extreme weather events and variation in precipitation for the period 1981 - 2005 compared with 1951 - 1981. Vojvodina is reported to have experienced the most increased variation of climate change characteristic in entire Serbia during the last decades, especially in the case of precipitation.

While the risks of major floods due to extreme rainfall conditions exists, climate change models suggests that Vojvodina is expected to receive slightly decreased annual precipitation for 2040 is compared with 1985 - 2005. The most significant decrease in precipitation is expected in the summer whereas precipitation during the winter wheat vegetation period is expected to increase. Precipitation is projected to decrease for the spring crops vegetation period as well (10.2 - 21.9% for 2040 and 17.1 - 31.9% for 2080).

⁸ Adapted from <http://www.climateadaptation.eu/serbia/climate-change/>

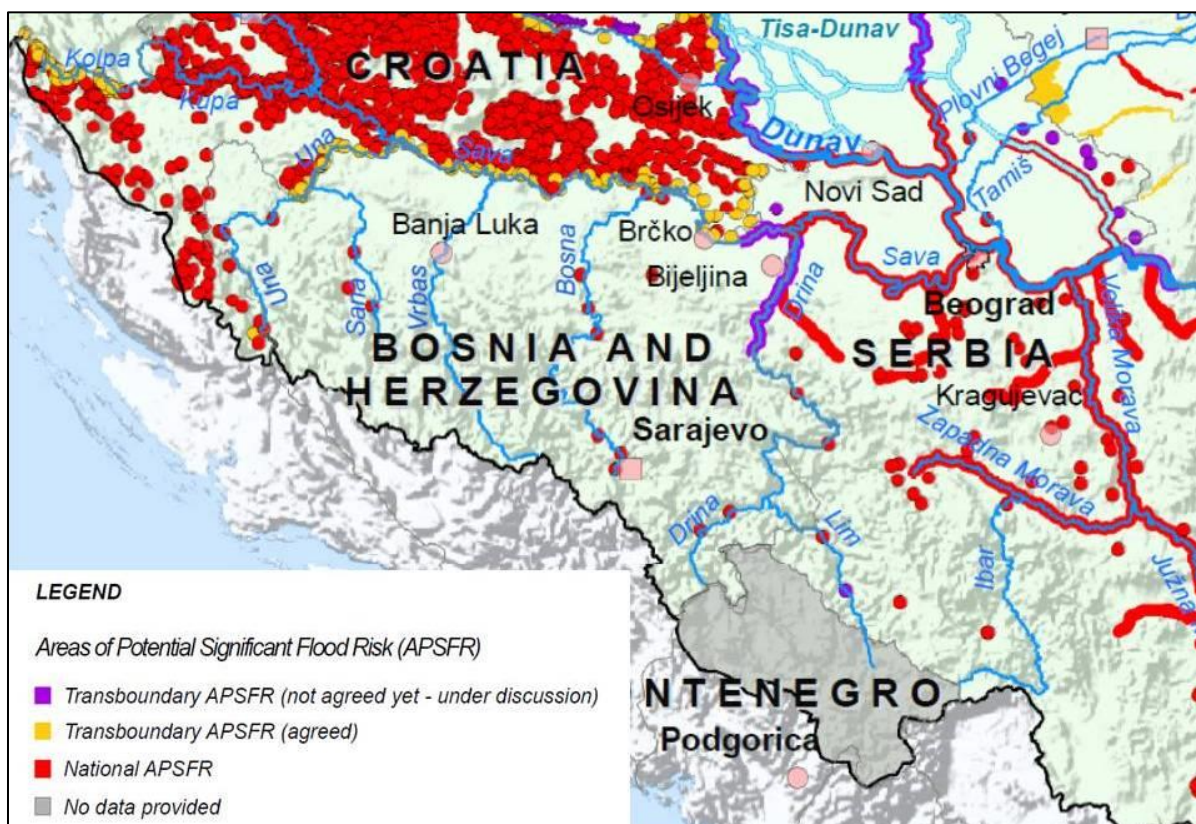
3.2 Flood risks

The programme area is rich with water resources given presence of Danube - the major watercourse in the study area - and its many tributaries which are the Drava (at km 1,382.5 of the Danube), and Vuka (at km 1,333), Tisa (km 1,215) and Sava (km 1,170). The Tisa and the Sava significantly increase the Danube discharge, while the Drava and other tributaries have considerably smaller influence on the Danube flow regime. The programme area in Serbia - Vojvodina - is intersected with high density Danube – Tisa – Danube canal network. Only 1 % are domicile waters, so the cross border influences should be considered as important.

Flood protection

As evident from the Figure 2 below, the programme area features a number of transboundary areas of potential floods risks along the border between Croatia and Serbia (spots marked by violet and yellow colors) as well as national transboundary areas of potential floods risks on the Croatian part of the study area. Currently around 15% of the Croatian mainland is under potential flood risk and the programme area can be generally characterized as flood prone. Vulnerability to flood is further enhanced by topography of the programme area and that fact that in recent years, floods occur even where no one expects them and increasing high water events and new maximum water levels are recorded on many watercourses⁹. The full designation of national transboundary areas of potential floods risks on the Serbian territory is in process of preparation.

Figure 2 Areas of potential significant flood risks in the programme area



Source: Sava River Commission, 2013

⁹ Zoran Đuroković. Exposure to Flood Risks in the Republic of Croatia. 2014

In the past, large floodplain areas (Baranja in Croatia, Bačka and Banat in Serbia) were flooded several times each year. The flood areas are characterized by wide alluvial valley and low riverbanks. For that reason, organized flood protection works began at the end of the 18th/beginning of the 19th century. Danube was confined by dykes along both banks. Flood protection and drainage in the wide lowland areas made urban, rural and traffic development as well as agricultural production possible. However, there are still two reaches along the Pannonian Southern Danube which have nearly intact floodplains: broad flood prone areas along the Drava mouth (~40,000 ha in HR and RS), and upstream of the Tisa confluence (~20,000 ha):

- Present situation in Croatia: 21 km long levees downstream the Drava mouth enable protection from a 100-year flood.
- Present situation in Serbia: Flood protection structures are almost continuous along the left bank of the Danube. Along the right bank levees are built on some localities in the Srem region.

The concept of flood protection of the Danube and Drava is based on embankments and wide inundation zones along watercourses. On some sections they do not meet their required height, so they need to be reconstructed. The biggest remaining problem of flood protection in the Danube basin is uncontrolled torrents that threaten settlements and agricultural areas.

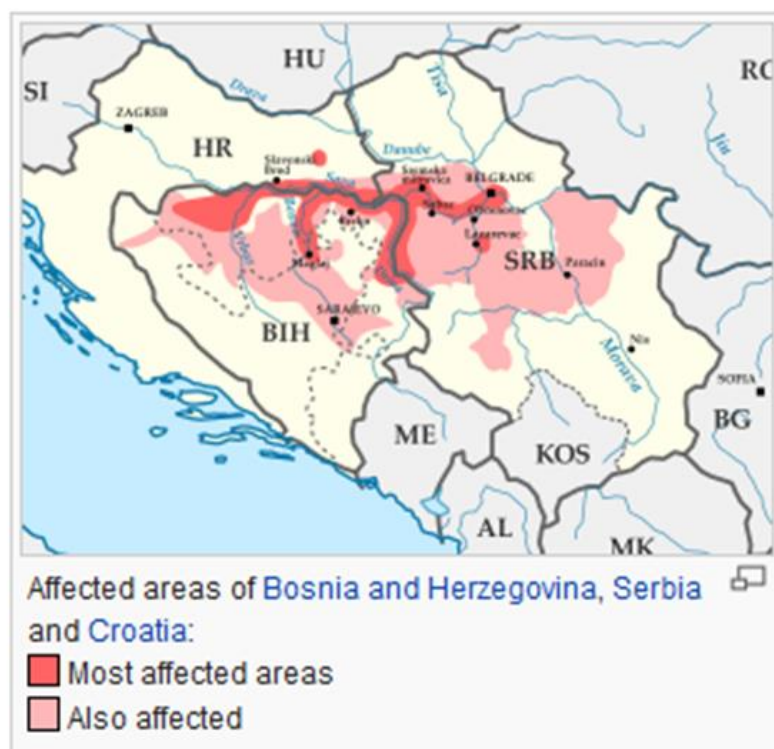
Dikes along the Danube River have been built on the Baranja section, from the Croatian - Hungarian state border down to the Drava River mouth, approximately 100 km in length. This area is mainly protected of 100-year flood period. In north-western vicinity of the Drava mouth into the Danube River, in the triangle of Danube and Drava Rivers and the Hungarian state border, there is the Nature Park "Kopački rit" as a natural retention (wetland) of 229 km². The area downstream of the Drava River mouth to the state border with Serbia near the town of Ilok is mainly protected by high riverbanks. In addition to the river Vuka there are 4 minor torrential streams endangering this area by flash floods. So far, this area has been protected against flash floods with an accumulation with storage retention space and a 17 km long drainage canal.

Areas along the river Sava are generally insufficiently protected. Downstream from Zagreb to the border with Serbia, many areas have a lower protection level than needed. Flood protection system of Srednje posavlje is incomplete and existing embankments at many locations are lower than needed. Due to reduction in peak flows of flood waves in lowland retentions system of Srednje Posavlje is crucial in flood protection in Slavonian section of Sava downstream from Stara Gradiška and from floods from neighbouring countries.

Transboundary concerns

Of great significance in the programme area are recent major floods in mid May 2014 when continuous heavy rainfall resulted in extensive flooding in Serbia, Bosnia and Herzegovina and Croatia. The Sava river rose to record-high levels, threatening the cities of Slavonski Brod, Šabac and Sremska Mitrovica and numerous villages and embankments gave way in several places. The Figure 3 gives a basic overview of May 2014 flood affected areas.

Figure 3 May 2014 flood affected areas on Sava River

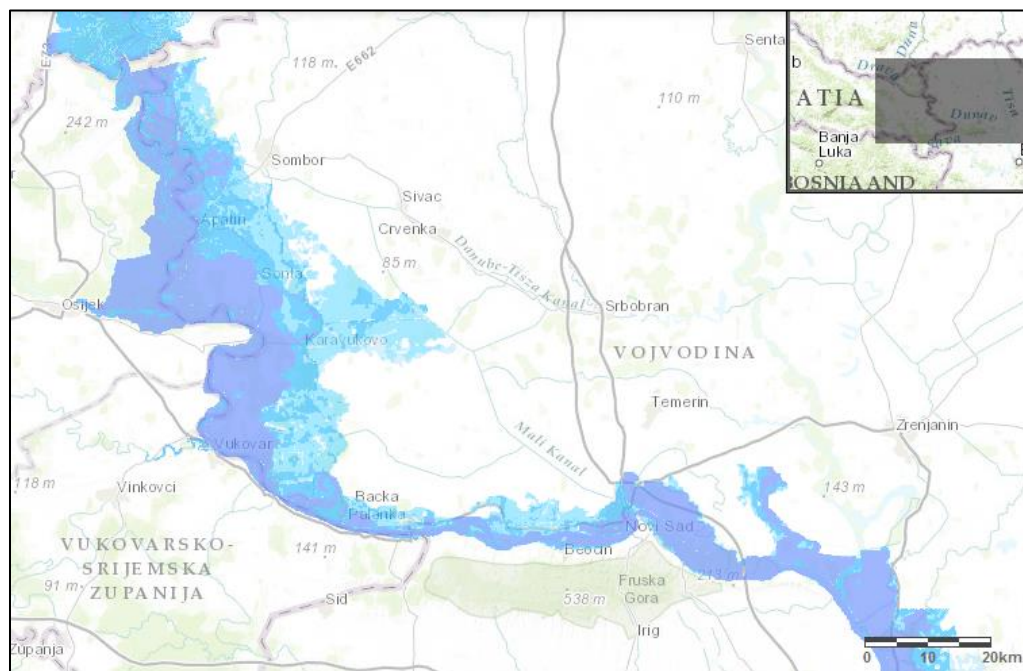


Source: Wikipedia

The damage was relatively contained as the population, helped by army and volunteers, strengthened flood defences. Nevertheless, in Serbia, the floods affected some 1.6 million people and resulted in 51 casualties, of which 23 were due to drowning. Around 32,000 people were evacuated from their homes. The majority of evacuees found accommodation with relatives, but some 5,000 required temporary shelters in camps established by the Government and the Serbian Red Cross. Health facilities, schools and agricultural lands were damaged. On 15 May the Government declared a state of emergency for its entire territory. In Croatia, the floods caused widespread power outages, water shortages, damage to the infrastructure, livestock and livelihoods, and displacement. Three people were killed, and, out of the estimated 15,000 people evacuated, more than 7,000 were registered and looked after by the Croatian Red Cross

Of specific transboundary interest are also potential future large-scale floods along the Danube caused by rainfall conditions in the upper of the Danube basin. Prevention of such floods is effectively beyond the scope of influence by watershed management interventions in the programme area. Danube in this section has all characteristics of alluvial rivers, with low gradients, a sandy riverbed and, consequently, highly variable morphological characteristics of the river channel (meandering, distortable and bifurcating course; numerous branches, islands and sandbars; and varying width and depth of the riverbed). The scale of flood risks is illustrated on the Figure 4 below which represents the flood depth at any given point for the extreme event of a 1000 years flood. Note that this map - taken from the Danube Flood Hazard Map Atlas funded by the EU South East Europe programme - is based on modelling and on a number of statistic assumptions. It represents the most unfavourable flood situation for any given point and thus the threat posed to individuals.

Figure 4 Danube flood hazard map for the programme area



Source: Danube FLOODRISK project , 2012, available from <http://www.biodiversity.ro/atlas/>

Key: Water Depth

	> 4m
	2m - 4m
	0,5m - 2m
	< 0,5m

In this respect the major short-term common environmental challenge in the programme area is the prevention of floods. A lack of integrated monitoring and management systems for flood prevention and alerts has contributed to catastrophic consequences in the region. In this regard, particular attention should be given to recommendations provided by the International Commission for the Protection of the Danube River (ICPDR) which serves as the platform for coordination of the implementation of the EU Water Framework Directive on the Danube basin-wide scale. Current highest priority for the ICPDR, as all its contracting parties, including non-EU countries, is a coordinated implementation of EU Water Framework Directive together with the EU Floods Directive..

3.3 Water quality

The situation with regard to the quality of surface waters in the programme area shows variations on both sides of the border.

Croatia

Freshwater bodies

The quality of major rivers in the project area in 2009 is given according to their chemical (priority actions substances and other relevant pollutants) and physical - chemical indicators (BOD₅, COD, and total phosphorus and nitrogen). Chemical status of rivers and streams is good in all counties except

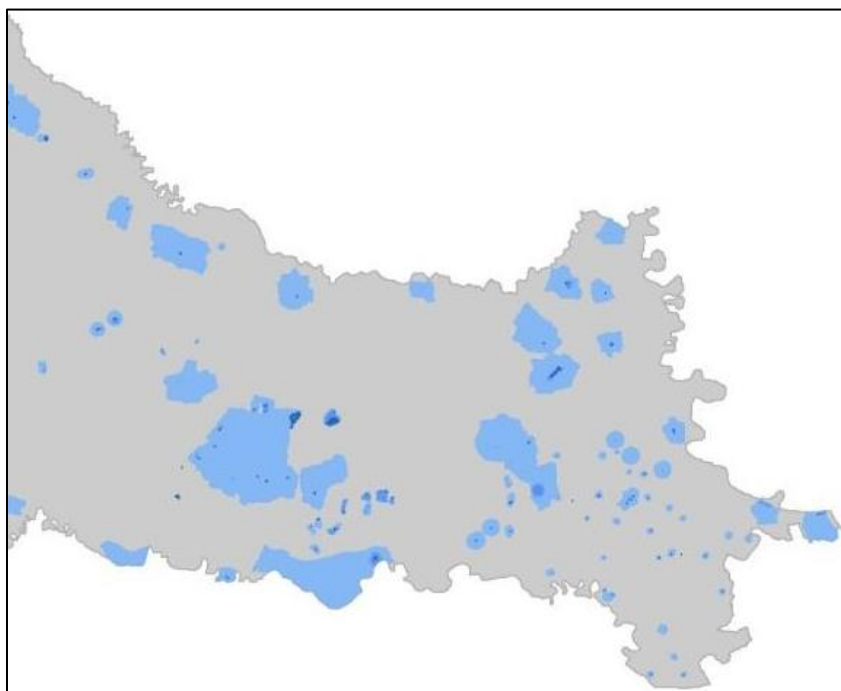
few rivers in Osječko-baranjska and Vukovarsko-srijemska county. With regard to BOD₅ and COD there is overall good status in all Croatian counties with exceptions of some smaller rivers and streams in all counties. In regard to total phosphorus and nitrogen there are vulnerable water bodies in all counties. The problems with surface water quality is related with public drainage (urban areas) and uncontrolled discharge of wastewater from households without connection to the public sewage system (rural areas), agriculture, through poorly managed livestock farms and the use of fertilizers and pesticides, industrial wastewater discharge, waste management and flow of pollution from neighbouring countries.

With regard to nitrate pollution of agricultural origin, there are at the moment no vulnerable areas in Osječko-baranjska County while the town of Ilok and municipalities of Borovo and Lovas in Vukovarsko-srijemska county are considered as vulnerable and are regularly monitored.

Ground waters

In the programme area there are numerous water protection zones for potable water springs - see Figure 5 below. The quality of groundwater is defined by its chemical and quantitative status. In the project area there are 3 major bodies of groundwater, the Eastern Slavonia – Drava basin, Eastern Slavonia – Sava basin and Orjava basin. Groundwater ecological status includes two categories: good and bad. All above mentioned groundwater bodies have been evaluated as good for chemical and quantitative status.

Figure 5 Water protection zones for potable water springs in Croatian part of the programme area



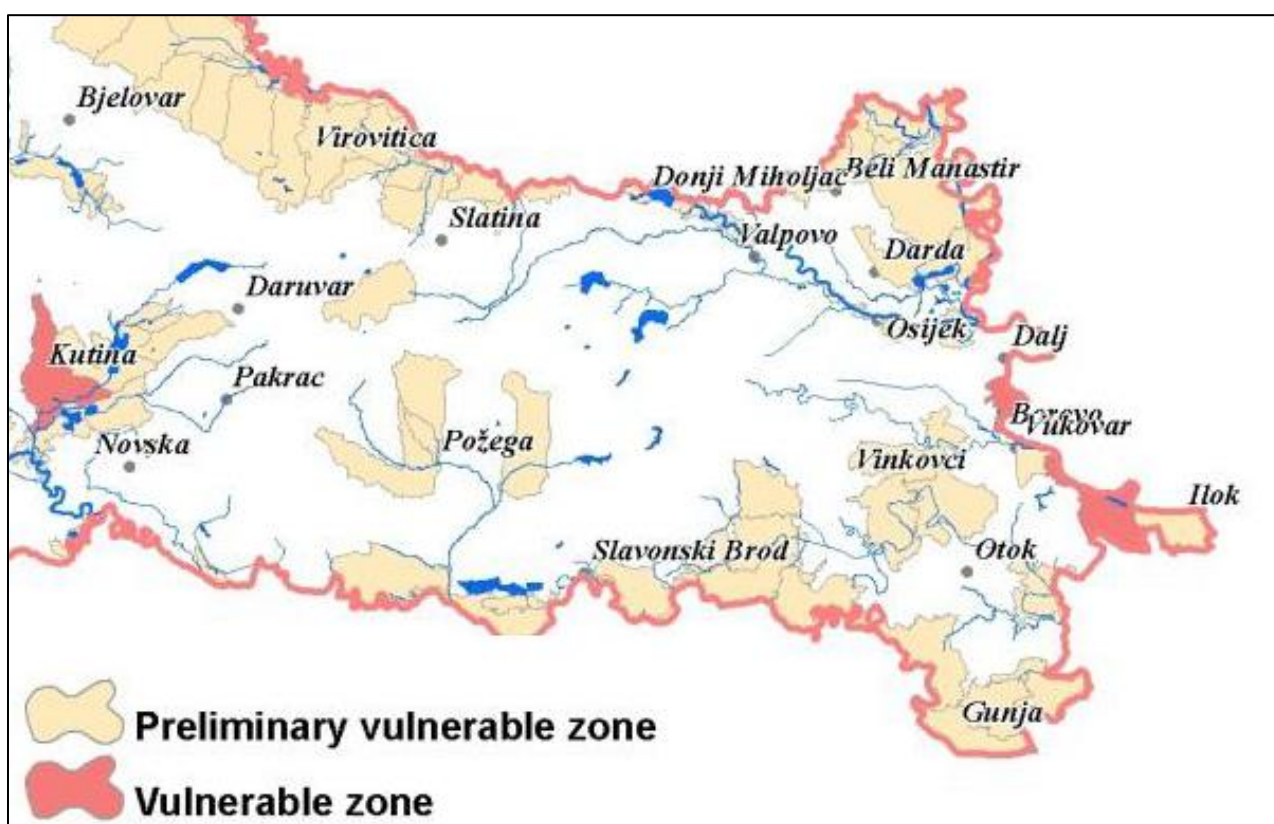
Source: Plan upravljanja vodnim područjima, Hrvatske vode, 20131

Nitrate pollution

Ministry of Agriculture in 2012¹⁰ identified vulnerable zones and potential (preliminary) vulnerable zones land that drain into nitrate polluted waters, or waters which could become polluted by nitrates in the natural boundaries of hydrological basins. The zones have been determined based on the monitoring of surface and ground water and also to the natural conditions - the vulnerability, the share of agricultural land and the prevailing hydrogeological conditions.

The highest nitrate concentrations in water are present in areas of intensive agricultural production, through unmanaged livestock farms and the use of fertilizers and pesticides, which represents the greatest threat to groundwater pollution by nitrates in the form of diffuse or point source pollution. With regard to nitrate pollution of agricultural origin, there are at the moment no vulnerable areas in Osječko-baranjska county but the town of Ilok and municipalities of Borovo and Lovas in Vukovarsko-srijemska county are considered as vulnerable and are regularly monitored - see the Figure 6 below.

Figure 6: Designation of nitrates vulnerable zones in the Croatian part of the programme area



Source: Republic of Croatia, Ministry of Agriculture, 2012

Serbia

Comprehensive water quality data for the Serbian part of the programme area are missing but situation with regard to water quality appears to be much worse. The situation in Serbian part of the programme area is characterized by untreated and inadequate treated effluents from settlements, industry, agriculture and other sources highly contaminate aquatic ecosystems. The most vulnerable are small watercourses with low self-purification capacity and Danube Tisa Danube Sava canal

¹⁰ Designation of nitrates vulnerable zones and economic impact of nitrates directive implementation in Republic of Croatia, Ministry of Agriculture, 2012

network. The most serious problems are intense eutrophication and heavy metals accumulation in aquatic ecosystems. Increased levels of nutrients, as a result of untreated sewage effluent and agricultural run-off carrying fertilizers, lead to eutrophication.

In the last fourteen years the worst quality was in the waters of Vojvodina's rivers and canals. Expressed with indicator Serbian Water Quality Index, compared to the total number of samples from all watersheds, the result is very bad in as much as 83% of the samples from Vojvodina's territory. Poor condition of water quality in this watershed is further accompanied by the information that even 45% of samples are in categories bad and very bad.

As far as the Tisza River, a tributary of the Danube, it is important to note that the pollution channel Vrbas-Bezdan is going through the mid-size town Vrbas (25,000 inhabitants) and is characterized as the "worst in Europe". The area of influence from the most upstream point is Sivac, Kula municipality, and ends about 30 km downstream, which is known as the "Triangle". "Triangle" is where the Vrbas-Bezdan flows into the channel Becej-Bogojevo (in the vicinity Vrbas plans to build a central plant for waste water treatment).

Heavy metal concentrations exceed target limits for aquatic environment and the most prominent problem is their deposition in sediments, as well as the accumulation of the other priority and priority hazardous substances, as pesticides and mineral oils.

3.4 Biodiversity

The programme area encompasses 1697 km² of protected areas listed in the Table 3 below. There are other protected areas within the programme area such as reservations and monuments of nature of lower protection classification that also present natural richness.

Table 3: Surface of protected areas per county/district

NUTS 3	Surface of protected areas per county/district									Share of protected areas in the county surface (%)
	County land surface (km ²)	Park of nature – land (ha)	Special Reserve (land) (ha)	Regional Park (ha)	Park - forest (ha)	Important Landscape - land (ha)	Monument of Nature (ha)	Monument of Park Architecture (ha)	Total protected area (real) (ha)	
Croatia										
Osječko-baranjska county	4,157.74	17,052.06	6,164.54	26,016.14	-	149.22	0.61	150.75	49,533.32	11.91
Vukovarsko-srijemska county	2,452.97	-	229.15	-	89.98	1,165.11		21.76	1,506.00	0.61
Požeško-slavonska county	1,823.39	18,954.60	-	-	-	71.47	0.08	18.90	19,045.05	10.44

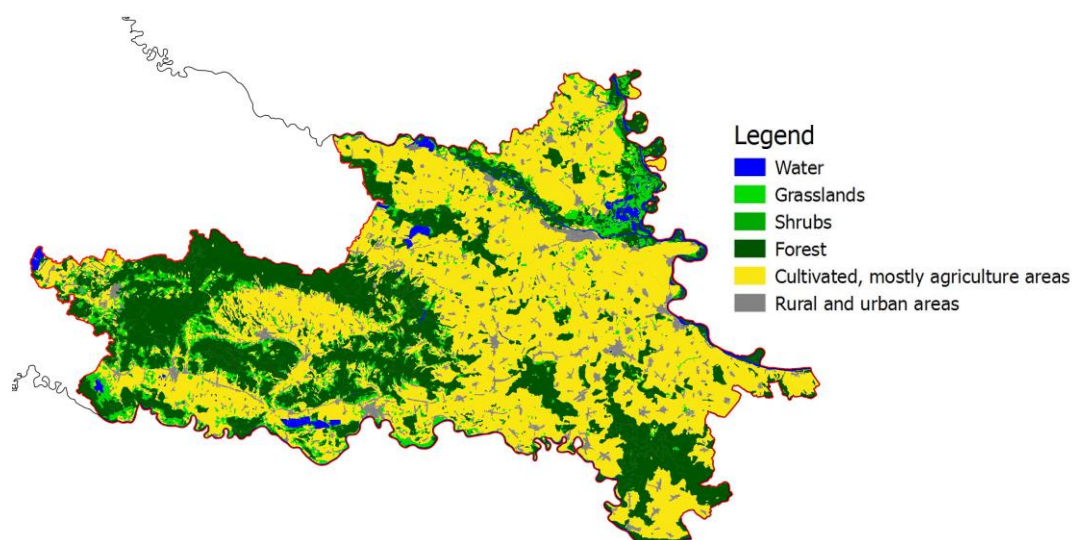
Brodsko-posavska county	2,029.50	3,262.00	965.73	-	-	20,070.82	-	-	24,298.55	11.97
Serbia										
Srem District	3,486		35,884						36,052	10.34
South Bačka District	4,016	2,595	9,054						12,059	3
West Bačka District	2,420	19,605							19,605	8.1
North Bačka District	1,784	712	1,523			5,369			7,604	4.26
Mačva District	3,268	7							7	0.002

Source: IPA Cross-border Cooperation Programme Croatia-Serbia 2014-2020, data provided by the State Institute for Nature Protection (2012) and Republica Sbrska

Croatia

The programme area is very rich in biodiversity which is expressed through various habitat types as well as numerous species. Since the programme area extends over predominately lowland area, intensive cultivated habitats are most dominant habitat type while forests are represented by fragments along rivers, especially Drava and Dunav, in flood plains (mostly alluvial forests) and in Panonian hills (mostly mountainous beech forests).

Figure 7: Habitat types in the Croatia part of programme area



Source: State Institute for Nature Protection (WMS Service)

The most notable parts with great biodiversity value are wetlands and alluvial forests of Kopački rit, along Drava and Danube rivers in the north as well as Sava River in the south.

Kopački rit Nature Park is situated mainly in lowlands between the Drava and Danube rivers in the flat part of Baranja, part of Osječko-baranja County, the state border with the Republic of Hungary and the state border towards the Republic of Serbia which is designated as the Nature Park's eastern border. Kopački rit is a floodplain that developed due to the activities of two large rivers, the River Danube and the River Drava. The total flooded area covers an area of about 33,000 ha, of which 17,700 ha is protected. Significant flood areas left outside of the Nature Park boundaries stretch from Batina up north, to Bijelo Brdo down south and Donji Miholjac towards west.

It has a typical relief structure because of the river's water activity and the floodwaters that flood the area. The entire floodplain resembles a delta and this so-called "inland delta" is exceptional because the River Danube creates it in its middle stream with the assistance of the River Drava. Such a phenomenon, in this form, is unique in Europe and therefore has a global significance.

Kopački rit Nature Park has been included in the List of Wetlands of International Importance established under the Ramsar Convention in 1993, because of its great biological diversity and especially value as a waterfowl habitat. In the winter, the Park is inhabited by more than 20,000 birds. To date, the biodiversity recorded in the area includes: 400 plant species, 400 invertebrate species, 44 fish species, 293 bird species (of which 141 nest permanently or temporarily) and 55 mammal species.

Kopački rit Nature Park is a tourist destination in terms of rural tourism on family farms, hunting tourism, bird watching etc., however, it is not sufficiently exploited. A part of Kopački Rit has been designated as a Special Zoological Reserve. Both the Nature Park and the Special Zoological Reserve, which is located within Park boundaries, are listed as Important Bird Areas (IBA).

Regional Park Mura- Drava is situated along the Mura and Drava rivers and is located in 5 Croatian counties, of which Osječko- baranjska County is part of the programme area (29,84% of the total area of the Regional Park). It ends at the border of the Kopački rit Nature Park. According to the Nature Protection Act, a Regional Park is a large natural and partly cultivated land where economic and other activities are permitted, if they do not threaten its core features. Tourist activities in the area are becoming an increasingly important source of revenue although organic agricultural production is becoming important as well.

Within the Regional Park's boundaries particularly significant are wetlands that are among the most vulnerable in Europe, significant habitats include: riparian forests, wet meadows, dead branches, abandoned meanders and troughs as well as steep landslide riverbanks. These habitats are in good condition but primarily threatened by changes in the water regime, as a consequence of flow regulation, water pollution, introduction of invasive alien species and others. The variety of habitats provides shelter for a great number of species. The most significant protected animal species are as follows: Wild Cat (*Felis silvestris*), Otter (*Lutra lutra*), Beaver (*Castor fiber*), Pond Bat (*Myotis dasycneme*), Pygmy Cormorant (*Phalacrocorax pygmaeus*), Willow Warbler (*Phylloscopus trochilus*), White-tailed Eagle (*Haliaeetus albicilla*), Little Tern (*Sterna albifrons*), Danubian Newt (*Triturus dobrogicus*), Blackwinged Stilt (*Himantopus himantopus*), Bittern (*Botaurus stellaris*), Purple Heron (*Ardea purpurea*), Great White Egret (*Egretta alba*), Black Stork (*Ciconia nigra*) and others..

Within the Park, some smaller areas are also protected under more restrictive categories, such as the Ornithological reserve Podpanj in Osječko- baranjska County. Podpanj is situated in Donji Miholjac, where, according to the available data, 106 species of nesting birds have been recorded. From them

three are endangered species worldwide, out of the twenty-four European species, and 27 species that have an unfavourable conservation status in Europe, out of 195 European species. Given the relatively small area, its value as breeding grounds is notable both at national and European level.

As mentioned above, the great biodiversity value is related also to Panonian hills- Papuk and Krndija, which are significant for its mountainous beech and oak forests flora and fauna. Due to the exceptional biological value as well as geological and cultural diversity contained in a relatively small area of 336 km² Nature Park Papuk was established.

The terrain is diversified and has numerous hillsides, hilltops, ridges, ravines and lagoons with different slope. Eleven types of forest communities cover about 96% of the area. A total of 1,223 species of flora was recorded, representing about a quarter of the whole Croatian flora. Most of the fauna are forest dwelling species, but many species are aquatic or inhabit wetlands. According to conclusive results of a recently conducted biodiversity survey 24 fish species, 16 amphibian species, 11 reptile species, 108 bird species and 45 mammals species (14 of which are bats) as well as numerous invertebrate species reside in the Nature Park.

Tourist offer of the Nature Park is based mostly on hiking, walking tours, cycling etc. but for the future development of tourism it is necessary to expand the tourist offer and improve the tourism infrastructure.

Serbia

The lowland region of Serbia (Vojvodina) is dominated by agricultural landscape and the remains of natural grasslands provide habitats for endemic species of Pannonian biogeographical region. Specific centres of ecosystem diversity, located in Vojvodina must be stressed here, with their continental sand, steppe and halophytic communities, which are found only in a few areas: Deliblato and Subotičko-Horgoška sands (Deliblatska and Subotičko-Horgoška peščara), "mosaic" salty grounds in Banat and Bačka.¹¹

Key areas of concerns in terms of protection of key ecosystems and their connectivity are:

- National park Fruška Gora
- Nature reserve Obedska Bara,
- Special nature reserves: Zasavica (Srem and Mačva), Selvenjske pustare, Ludaš lake (North Bačka), Gornje podunavlje (West Bačka), Koviljsko-petrovaradinski rit, Karadjordjevo, Bagremara (South Bačka).

Fruška Gora is an isolated, narrow, island mountain in Pannonia plain. It is intended by river courses extending to the south and north, with some side ranges with steep slopes, spreading from the main narrow range. Its location, specific geological history and different microclimatic conditions make it very interesting and important to science. Thanks to unique and very rich deposits of fossil fauna and flora, Fruška Gora is called the 'mirror of geological past'.

The main characteristic of this region is the existence of numerous protected, rare and endangered species. Fruška Gora's valleys are covered with pastures and fertile fields, numerous vineyards and orchards which decorate its lower slopes while higher ground, above 300 meters, is covered with dense deciduous forests.

¹¹ Fourth National Report To The United Nations Convention On Biological Diversity, The Republic Of Serbia, Ministry Of Environment And Spatial Planning, 2010

In terms of vegetation Fruška gora represents a forest area with varied types of climatogenous forest communities. The forests cover about 90 % of the total surface of the area. The dominant forests are mesophillous mixed forests of sessile oak (*Quercus penea*) and European hornbeam (*Carpinus bentlus*), orographically conditioned beech forests, as well as thermophilous forests of Turkey oak (*Quercus cerris*), pubescent oak (*Q. pubescens*) and hungarian oak (*Q. farnetto*). A significant share of the silver linden (*Tilia ronrenrosa*) is a special feature of the forest phytocenoses in the Fruška gora, conditioned by the climate in the border areas of the Pannonian Plain. On the eastern part of the Fruška gora and on the Fruška gora loess plateau steppe vegetation is developed. Habitats of the steppe vegetation have mostly been turned into plow land, and the steppe phytocenoses have been pushed out to the border areas and slopes of loess plateau.

Fauna of the Fruška gora is rich in species, but the populations of certain mammals and birds are considerably reduced. There are still quite large numbers of does, boars and other game species, while deer are bred in the hunting reserves in the National Park. Till today, 110 bird species have been recorded. The most important among them are: Imperial eagle (*Aquila heliaca*), booted eagle (*Hieraetus pennatus*), woodpeckers (*Dyobaes major* and *D. medtrs*), black woodpecker (*Dryocopus manius*), raven (*Corvus corax*), and numerous song-birds. Some of the rare or declining mammal species are: wild cat (*Felis sylvestris*), badger (*Meles meles*), pine marten (*Martes martes*), least weasel (*Mustela nivalis*), edible dormouse (*Glis glis*) hazel dormouse (*Muscardinus avellanarius*) and several species of bats (*Chiroptera*).

In order to provide adequate protection of the habitats of the important representatives of ornithofauna, and in accordance with recognized values of the ornithofauna in the characteristic biocenoses of the Fruška Gora, the Papratski Do Strict Reserve, Zmajevac Research Reserve and 12 potential ornithological reserves, of total surface of 600 ha, have been protected or determined for protection.

Obedska bara (The Obed swamp) is located along the Sava river in the south of Srem (Vojvodina, Serbia). Once it was ornithological reserve and today a special nature reserve. The greatest value of this area lies in its authentic combination of stagnant tributaries, ponds, pits, swamp vegetation, wet meadows and forests with exceptional diversity of ecosystems and species, especially the endangered ones. Obedska bara is one of the few remaining inundated marshes with distinctive features, such as hundred years old mixed English oak forests, waterfowl colonies and numerous natural rarities. This swamp actually represents a remnant of the former meander of the Sava, located along its old riverbed. The main course of the river now flows more towards the south. Obedska bara is famous for its different marsh and forest habitats, numerous species of mammals, fish, amphibians, reptiles, insects and exceptional abundance of flora, ichtyofauna and above all ornithofauna. There are a total of 222 bird species, 145 of which nest in the pond area. Obedska Bara is also home of 800 nesting pairs of grey, red, small white, yellow and great white heron, including the little pied cormorant and night heron. Owing to its exceptional natural values, Obedska bara has been included in the Ramsar Convention list in 1977. It was the first site of such kind in the country. In 1989 it was declared the international Important Bird Area (IBA).

The Zasavica Special Nature Reserve is located east of the river Drina and south of the Sava. This area is dominated by a river biotope which is comprised of the Zasavica riverlet and its confluent Batar, as well as the Jovača and Prekopac canals. Zasavica is directly connected to the River Sava via the Modran Canal.

The reserve is brimming with rare plant and animal species, some of which are so rare that they are almost extinct. The area is home to over 600 plant, 198 bird, 27 amphibian/ reptile and 23 fish species. The most valuable species is a fish called the European mud minnow, which lives in only one

other location worldwide, and the waterwheel plant (*Aldrovanda Vesiculosa*), which grows exclusively at Zasavica.

The Reserve is also the guardian of genetic resources of Serbia since a rare species of pig – the swallow-bellied Mangalica is bred here, as is the Balkan donkey and the Podolian cow.

The Gornje Podunavlje comprises two large fens – Monoštor and Apatin which cover an area of 19,605 ha of forests, meadows, swamps and marshes, including the river Danube and its meanders. This reserve is home to 51 species of mammals, 248 bird species, 50 fish species, 11 amphibian species, 9 reptile species, a huge number of invertebrates, as well as 60 species of butterflies and over 1,000 different plant species.

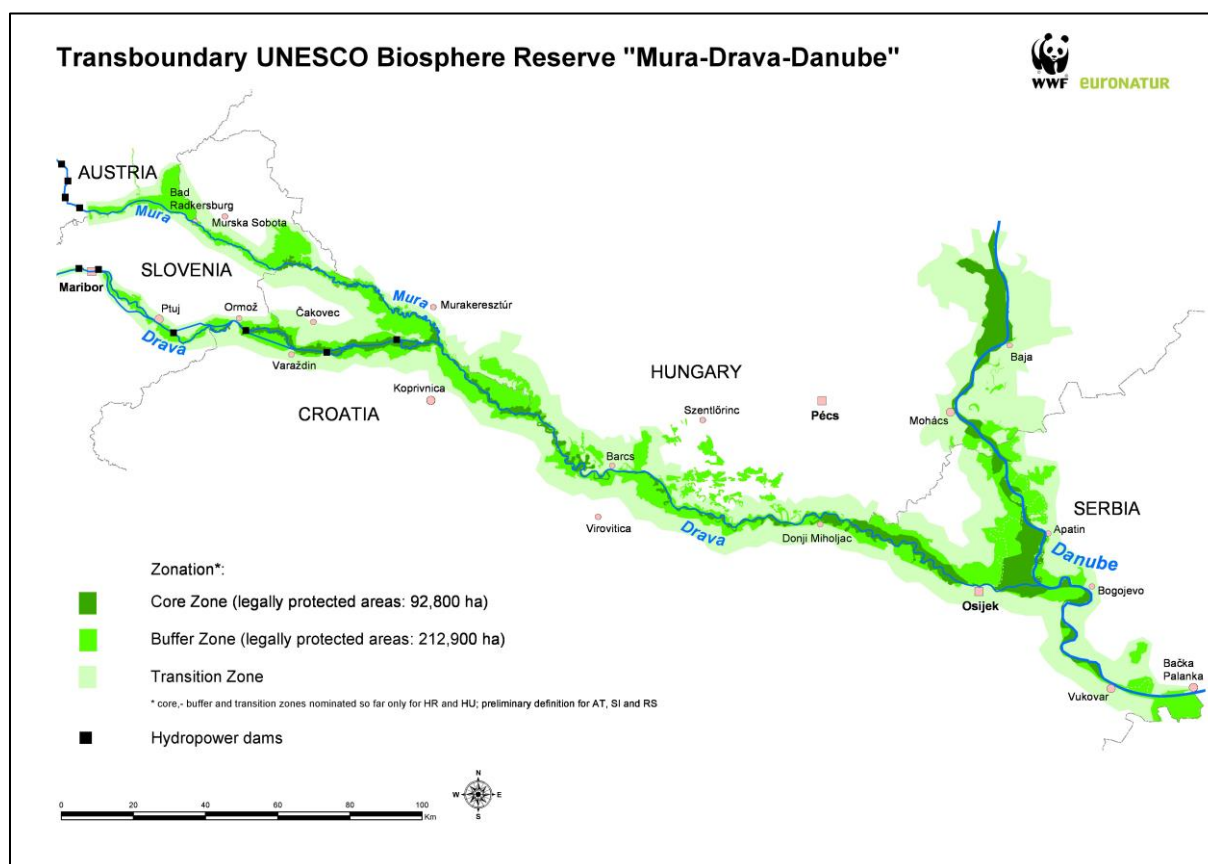
The Kovilj-Petrovaradin Fen (*Koviljsko- Petrovaradinski Rit*) is located in the southeast of Vojvodina's Bačka District, sprawled across both banks of the Danube near the towns of Kovilj and Petrovaradin. It is only 20 km from Novi Sad and 60km from Belgrade. This complex spans an area of 5,895 ha and is rich in wildlife that makes it an integral entity. Today's fenland area, which stretches for a length of 20 km, is a remnant of a former great, dense, lush and almost impassable fen. The main features making this area significant are its conserved and diverse wetlands (islets, river islands, backwaters, meanders and oxbow lakes), plant communities and diversity and abundance of fauna, especially waterfowl and fish. This fenland is home to 206 species of birds and 26 species of fish. The area is also a nursery for wild pike, carp and sturgeon. Rare animal species also live here, such as the wildcat and otter.

Specific transboundary interest

The Mura-Drava-Danube Biosphere Reserve

On 25 March 2011 the ministers responsible for environment and nature protection of Austria, Croatia, Hungary, Serbia and Slovenia signed a joint declaration establishing a Transboundary UNESCO Biosphere Reserve along the three rivers. The Mura-Drava-Danube Biosphere Reserve is to be implemented within the European Commission's Strategy for the Danube Region. The Biosphere Reserve will support the biodiversity objectives set by the European Council of Ministers in 2010, and will correspond to the objectives of the long-term 2050 biodiversity vision and the 2020 biodiversity target. Since the three rivers are covered extensively by Natura 2000 sites, it also contributes to the implementation of the Birds and Habitats Directives as well as the EU Water Framework Directive.

Figure 8 Proposed zoning of UNESCO Transboundary Biosphere Reserve Mura-Drava-Danube



Source: WWF, 2011

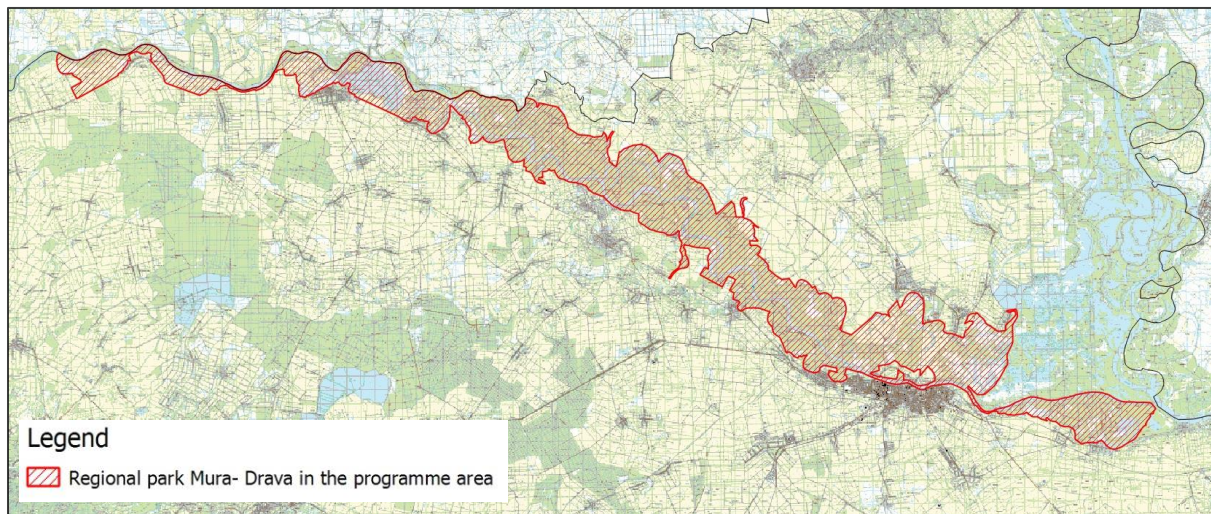
The transboundary biosphere reserve stretches along the Drava, Mura and Danube Rivers, which are separated by flood prevention dykes into an inundation area and a flood-controlled side. The biosphere reserve provides an important tool in learning different approaches to floodplain management

The majority of terrestrial habitats are covered by softwood or hardwood gallery forests, but there are also extensive grassland areas along the rivers. The area contains a variety of wetland habitats, including those that are among the most threatened in Europe: alluvial forests, wet grasslands, gravel and sand bars, islands, steep banks, oxbow lakes, stagnant backwater, abandoned riverbeds and meanders. They are surrounded by riparian forests and arable land with scattered pastures. This variety of habitats provides shelter for a great number of species.

The most significant protected animal species are as follows: Wild cat (*Felis silvestris*), Otter (*Lutra lutra*), Beaver (*Castor fiber*), Pond bat (*Myotis dasycneme*), Pygmy Cormorant (*Phalacrocorax pygmaeus*), Willow Warbler (*Phylloscopus trochilus*), White-tailed Eagle (*Haliaeetus albicilla*), Little Tern (*Sterna albifrons*), Danubian newt (*Triturus dobrogicus*), Blackwinged Stilt (*Himantopus himantopus*), Bittern (*Botaurus stellaris*), Purple Heron (*Ardea purpurea*), Great White Egret (*Egretta alba*), Black Stork (*Ciconia nigra*) and others.

In July 2012, UNESCO MAB Committee in Paris officially approved the Croatian - Hungarian part of the biosphere reserve Mura - Drava - Danube. Since then, 80% of the territory of the future pentalateral river area of 800 hectares is under international protection.

Figure 9: UNESCO Transboundary Biosphere Reserve Mura-Drava-Danube in Croatian part of the programme area

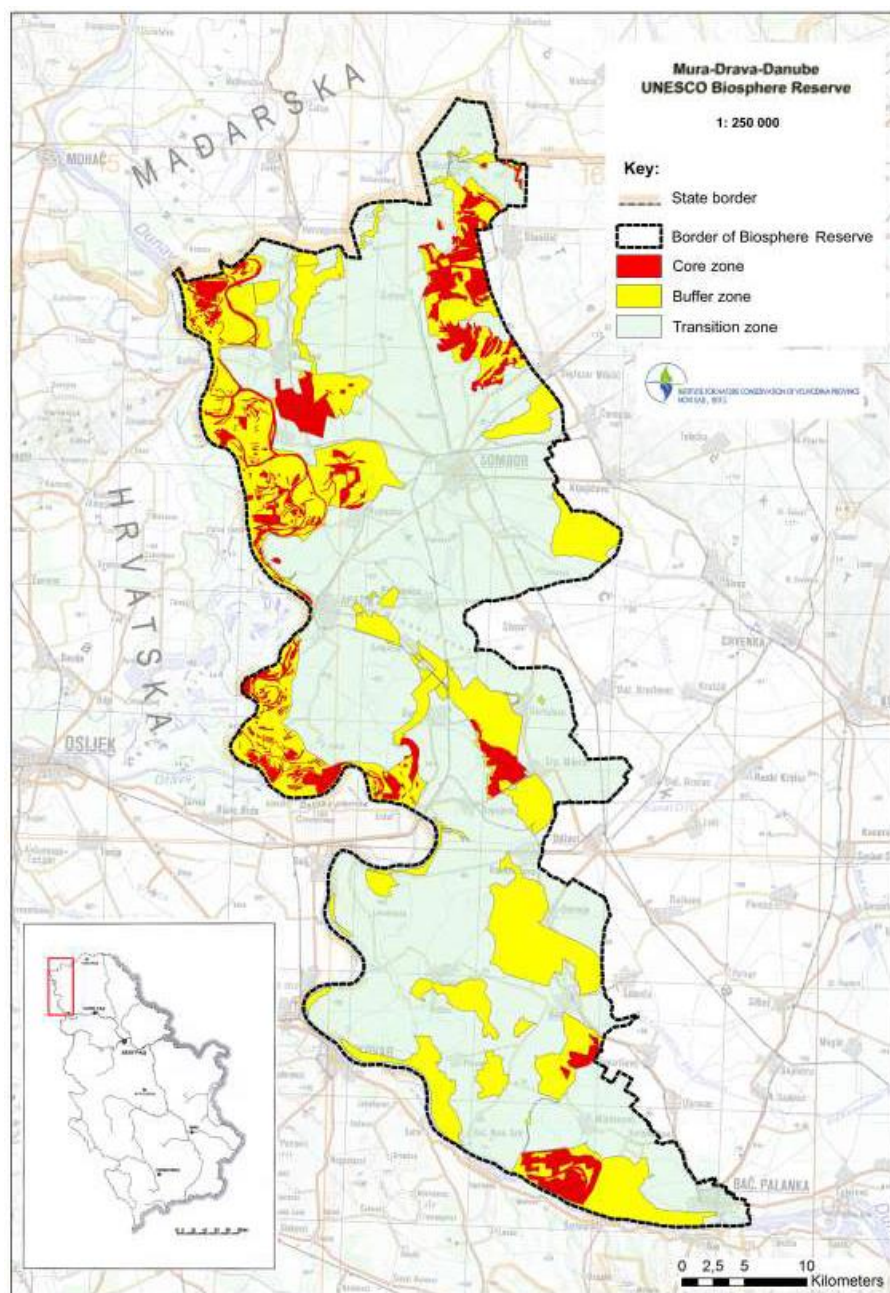


Source: State Institute for Nature Protection (WMS Service)

Serbia submitted its nomination of the protected areas within the planned biosphere reserve Mura - Drava - Danube in 2013.

The total surface of the core zone of the reserve is 11.242 ha and it comprises the best conserved and the most important spatial units in the forest mosaic within the floodplains, as well as the most valuable forest compartments and alkaline meadows outside the floodplains. The area of the proposed Serbian part of the Biosphere Reserve (See Figure 10) is the largest conserved floodplain complex in the upper course of the Danube River in Serbia and also one of the largest floodplains along the middle section of the Danube.

Figure 10: Proposed zoning of UNESCO Transboundary Biosphere Reserve Mura-Drava-Danube in Serbian part of the programme area



Source: Republic of Serbia, Nomination Form for Mura-Drava-Danube Biosphere Reserve, 2013

3.5 Forests and forestry

Croatia

Forest areas in Croatia have increased dramatically since 1991 when only approximately **33%** of the territory was covered with forests. Nowadays, forest coverage amounts roughly **45%**, which is to a great extent the result of war casualties, mine fields which cover a large portion of the country and also constant demographic changes in terms of the abandonment of rural areas which is the main reason for natural succession of forests over former agricultural lots.

Forests of the programme region (wider area alongside the Danube, Drava and Sava river) are not of a high commercial value, but nevertheless play major role in water regime regulation, flood prevention and soil conservation. Most of the area alongside these three rivers are covered by floodplain forests with major tree species being willows (*Salix* sp.), poplars (*Populus* sp.), black alder (*Alnus glutinosa*) and narrow-leaved ash (*Fraxinus angustifolia*). Wider flooding area which is not under heavy influence of flooding, but is influenced nevertheless, is covered by pedunculate oak forests (*Quercus robur*), which is the most valuable commercial tree species in Croatia. Pedunculate oak forests represent the border between plain and hilly forest vegetation. On the hilly part of the programme region (Požeško-slavonska County), tree vegetation shifts to the forests of hilly (colline) belt with the most abundant tree species being European beech (*Fagus sylvatica*), sessile oak (*Quercus petraea*), silver fir (*Abies alba*), hornbeam (*Carpinus betulus*), rowan (*Sorbus* sp.), ash (*Fraxinus excelsior*), maples (*Acer* sp.) and others.

Croatia is still the only country in the world which has all of its state-owned forests certified since 2002 by the prestigious FSC certificate which guarantees sustainable, nature-oriented and responsible forest management. Approximately **75%** of forests is state-owned (this figure varies in accordance with different interpretations of forests), while the rest is subject to various forms of private ownership (physical persons, companies, municipalities, institutions etc.). Recent most important trends in Croatian forestry include gradual increase in the percentage of private-owned forests due to continuation of the restitution process, increase in the overall annual cut¹² and the increased demand for woody biomass¹³.

State-owned forests are managed by the state-owned company "Hrvatske šume Ltd.", while private forests are managed by their owners, which are greatly aided by the Extension Service, Government's agency in charge of providing expert assistance in fields of agriculture, forestry and fishery.

Major pressures on forests in the programme region consist of fragmentation of forests through construction of various linear objects (oil pipelines, roads, power lines etc.), illegal waste dumps, overuse of pesticides and fertilizers in agriculture and inappropriate management (i.e. too heavy machinery which causes compaction of soils etc.). Major threat for forests in the programme region, however, cause **water amelioration interventions in agriculture** because they can significantly impact the level of underground waters, which may have a devastating effect on forests, especially pedunculate oak forests. This issue has to be addressed with ultimate attention and seriousness on strategic as well as on the project level. Subsequent pressures are comprised of a great coverage of mine - infested afforested land (67,7% of all mine infected area in Osječko-baranjska County, 78,8% in Brodsko-posavska, 59,9% in Vukovarsko-srijemska and 73,5% in Požeško-slavonska County, which gives an average figure of **70%** of forests and forest land participating in the whole mine infested area of the targeted region¹⁴), low management intensity, lack of institutional support and workforce for the management of private forests and continuous exacerbation of health state of Croatian forests as well as the non-resolved cadastral and proprietary issues.

Major initiative for the improvement of Croatian forests and forestry will be achieved through the realization of the Rural Development Programme of the Republic of Croatia for the Period 2014 -

¹² Ibid., p. 275

¹³ Pavelić, I., Kuric, D. (2013): Realization of Projects and Investments in Energetical Facilities ran on Woody Biomass, PPT presentation, 8th Croatian Days of Biomass, Našice, 6th September 2013, slide No. 17, <http://www.sumari.hr/biomasa/osmidanibiomase/06.pdf> [30th September 2014]

¹⁴ National Mine Action and Humanitarian Demining Plan (2009), OG 120/09

2020 (still in the process of endorsement), especially in private forests where a wide array of opportunities was defined, as well as some other programmes (Operational Programme for Cohesion and Competitiveness which provides possibilities for co-financing of the demining projects).

Serbia

The biggest part of the forests for the programme area is located in Vojvodina and is managed by the Public Company "Vojvodinašume".

The total area of forests and forestland covers 175,136.05 ha - Public Company "Vojvodinašume" manages the area of 130,589.26 ha, whereas private forests cover the area of 5,567.09 ha, water management companies account for 7,575 ha, agricultural organisations 5,989 ha, local communities 722 ha, Military Institution "Karađorđevo" accounts for 2,243 ha and Public Company National Park "Fruška gora" 22,450 ha.

Main tree varieties in the forests managed by the Public Company "Vojvodinašume" include: pedunculate oak, poplars, willows, narrow-leaved ash, white ash and acacia. Pedunculate oak forests mainly cover the area of the forest holding of Sremska Mitrovica and to a less degree of Novi Sad and Sombor forest holdings. They represent further east area in which Slavonian pedunculate oak is a prevailing variety.

Selected black poplar and willow varieties are used for the wood production and grown in intensive and highly productive plantations with the application of agrotechnical measures of varied intensity. Natural components of this variety exist within the limited areas, in unprotected marshland areas of the Danube, the Tisa, the Sava, the Tamis and other flooded river terraces.

Narrow-leaved ash is most frequently found in the community with the pedunculate oak occupying lower and damper geographic areas. White ash (*Fraxinus Americana*) prevails in unprotected areas of flooded river terraces. Despite being both technically and economically less significant variety compared to narrow-leaved ash, it has a great capacity of spontaneous propagation, thus representing a serious opponent to autochthonous forest tree varieties.

Acacia is most frequently found among forest crops grown in areas of sands, which act as protective forests. This variety has a significant use-value of wood. Its application encompasses the production of poles, mine timber and fuelwood and it has lately been used as valuable technical wood in industrial and trade-related processing.

In addition to previously mentioned varieties, the following varieties of forest trees may also be found in the forests on the territory of Vojvodina: Turkey oak, black and white pine, linden, white poplar, hornbeam and others.

Officially, forest land accounts for 8.10% of the total area of Vojvodina. However, the actual forested areas comprises 140,717.68 ha, so that actual level of afforestation amounts to only 6.51%.

This low level of afforestation is combined with very poor distribution of forests in Vojvodina. There are vast areas, which represent the whole entities comprising the territory of 500,000 ha, with the afforestation level hardly reaching 1%, as well as areas of around 100,000 ha with afforestation of less than 1%. In addition to economic benefits manifested in wood material production, the forests provide a number of other ecosystem functions importance which, extends far beyond the economic ones - e.g. alleviating climate changes, protecting the soil from water and aeolic erosion, protecting

tilled land from overdrying, preservation of biodiversity in forest and neighbouring eco-systems, preservation of the genofund of forest tree varieties etc.

Investments into improving the quality of forests, increasing the yield of both wood and their ecosystem functions is urgently needed because long-term production of agricultural crops will require existence of protective forest belts. In order to prevent further soil degradation, new forests should be planted as a matter of urgency and the level of the afforestation in the Province should increase from the current 6,51% to e.g. 14% of Vojvodina territory.

3.6 Soil

Croatia

According to the latest State Report on Spatial Conditions of Republic of Croatia, agricultural land accounts for approximately **47,6%** of the territory, **31,8%** is private, **11,2%** is state owned - not cultivated and **4,6%** is state owned - cultivated¹⁵. Primary programme area covers predominately the part alongside the Danube river which constitutes the border between Croatia and Serbia and also heavily influences the surrounding soil types, their genesis, development and composition. Therefore, soil types in the surrounding area of the Danube river are hydromorphic soils heavily influenced by the flooding regime and underground waters of Danube. The predominant soils on the Croatian side of the programme area alongside the rivers Danube, Drava and Sava comprise of fluvisols (eugley) in flood affected areas and partly ameliorated eugley with humofluvisol, humogley and fluvisol in the wider area alongside these three rivers. Western part of Baranja region is also covered with eutric cambisol and rigosol on loess, whilst in the western part of the programme region soil types shift in accordance with orographic factors, i.e. rising of the terrain and predominant soil types in this part are psuedogleys, cambisols and luvisols with smaller patches of vertic eugleys alongside smaller watercourses¹⁶.

The eastern-most part of Croatia is also the eastern edge of one of the two world's chernozem belts. Chernozem is one of the most fertile soil types in the world, and is a predominant soil type in northern Serbia (Vojvodina region), therefore eastern part of Croatia is also the most valuable part in terms of soil suitability for agriculture. Since this is the area of frequent flooding and intense agriculture, both irrigation measures and flood protection measures are of high importance for this region. The area under some sort of irrigation in Croatia accounts for only **0,86%** of cultivated agricultural land, which positions Croatia in the bottom rank of all European countries. Although Croatia disposes with a large amount of arable land and water resources suitable for irrigation, only a small portion of these resources is utilized. Bad situation in the current Croatian agriculture is also the result of low technological production level, small lots and low yields which results in importing of many of the agricultural products for which all preconditions for domestic production exist¹⁷. Amount of arable land used for ecological purposes is also constantly growing during the last decade, as well as the number of ecological agricultural producers¹⁸.

¹⁵ Derived from State Report on Spatial Conditions of Republic of Croatia, OG 61/13, p. 62

¹⁶ Bogunović, M., Vidaček, Ž., Racz, Z., Husnjak, S., Sraka, M. (1996): Soil Map of Croatia - Soil Suitability Map for Cultivation, Soil Science Department of Agricultural Faculty, University of Zagreb, 1996.

¹⁷ Faculty of Agriculture, University of Zagreb (2005): National Project of Irrigation and Management of Agricultural Land and Water, p. 1

¹⁸ Ministry of Agriculture, Fisheries and Rural Development, Department for Ecological and Integrated Agriculture (?): Capacities for Organic Production in Slavonija and Baranja, <http://www.ekopoduzetnik.com/kapaciteti-organske-proizvodnje-slavonije-i-baranje.pdf> [6th October 2014], p. 9-10

Major soil problem in the programme area is alkalization in Eastern Slavonia and Baranja, and the increase of the so-called "pedological drought", i.e. lack of useful water in the soil¹⁹. Concentration of heavy metals is below the maximum allowed in most of the cases, while there is slightly elevated amount of copper in vineyards. Consumption of mineral fertilizers has decreased tremendously after the war, although there is no permanent monitoring system of consumption of mineral fertilizers established²⁰. Acidification is a major problem on all soil types in Croatia, but has decreased in the period 1990 - 2000. Erosion on agricultural land appears on approximately 40% of cultivated land caused by both anthropogenic and orographic factors²¹. Soils in the programme area are also threatened by the use of pesticides, illegal waste dumps, industrial and communal waste waters and traffic corridors which heavily pollute the surrounding agricultural land with heavy metals, oil and dust. Programme region is heavily affected by mine fields, especially in the eastern part of the country (26,8% of all mine infested area in Osječko-baranjska County comprises of the agricultural land, 20,6% in Brodsko-posavska, 39,1% in Vukovarsko-srijemska and 25,4% in Požeško-slavonska County, which gives an average figure of **28%** of the agricultural land participating in the whole mine infested area of the targeted region²²).

Initiatives for global soil conditions improvement in the programme area comprise of projects "Soil Fertility Control on Agricultural Estates for the period 2009 - 2012" in Osječko - baranjska County and "Soil Analysis as the Basis for Fertilizing and the Increase of Agricultural Production of Perennial Crops for the period 2003 - 2009"²³ in Osječko-baranjska and Vukovarsko-srijemska counties²⁴, as well as the initiatives for the re-vitalization of rural areas via SAPARD programme²⁵.

Initiatives are mainly aimed towards establishing permanent soil monitoring system and revitalization and improvement of the agricultural soil and, accordingly, agricultural production in the programme region.

Serbia

Fertility analyses of the agricultural soil in Vojvodina indicate that the present dominant types of soil are slightly alkaline, carbonated, with humus and with optimal amounts of easily accessible phosphorous and easily accessible potassium. Systematic fertility control of agricultural soil in Vojvodina is done by Provincial secretariat of agriculture, forestry and water in collaboration with the Institute of Farming of Novi Sad and other expert services.

In Vojvodina 8.38% of soil samples have low content of organic carbon (0.1%). Estimated change in levels of organic matter in soil shows that in arable land quantities of organic carbon generally continue to drop and most likely as a result of agricultural use and the change in the way of land use. Total of 26% of analyzed soil under vineyards has exceeded over critical concentration of copper.

Terrain instabilities, with the appearance of landslides, mudslides, scree and collapsing of riverbanks are present in Serbian territory. Some of the deepest landslides are found in Danube and Sava coastal territories and also northern slopes of Fruška Gora which is important for the designated area.

¹⁹ EPA (2007): National State of the Environment Report, EPA 2007, p. 164

²⁰ Ibid., p. 168

²¹ Ibid., p. 168 - 171

²² National Mine Action and Humanitarian Demining Plan (2009), OG 120/09

²³ Osječko-baranjska County State of the Environment Report 2009 - 2012 (2014), p. 62

²⁴ APO d.o.o. (2006?): Vukovarsko-srijemska County State of the Environment Report, p. 67

²⁵ Ibid., p. 35

Analyses of the main types of localized soil pollution in overall number of identified localities shows that the biggest part in it takes the public municipal landfills with 43.5% and oil exploitation and processing with 22.5% localities. Also the urban soils in the designated districts are especially influenced by different anthropogenic factors.

The biggest part in identified localities in industrial areas is by oil industry with 43.1% and then chemical industry with 14.7% followed by metal industry with 9.6% of the localities.

Significant soil pollution can be expected in the following locations in the designated districts:

- Industrial zone Sombor
- Industrial zone Vrbas
- HI Hipol
- Cement factory Lafarge
- Industrial zone Šabac
- Industrial zone Zajača
- Industrial zone Loznica

3.7 Air quality

Croatia

Emission of all pollutants into the air (with exception of particulate matter) is generally on decrease in Croatia, as a result of accomplishing the basic goals in air protection during the period under consideration: improvement in air quality by reduction in harmful emissions to the levels where they do not affect physical health of population and environment, and upgrading and improving the air quality monitoring systems.

Croatian system of air quality protection is legally designated with Air Protection Act (Official Gazette 130/11) and a series of implementing regulations which regulates monitoring and improvement of air quality in state and on the local level. Basic provisions of the EU directives governing the field of transboundary air pollution were transferred to the Air Protection Act. Croatia is a party of Convention on Long-range Transboundary Air Pollution (LRTAP). For the Convention purposes relevant information about the effects of pollution in various environmental components are preparing, based on the complex process of measurement and modelling results for the whole Europe (EMEP program).

During 2012., in the programme area on the Croatian side of the border, measurements of air quality were done on 4 automatic measuring stations - Slavonski Brod-1, Kopački rit, Zoljan (near Našice) and Osijek (HR-OS 1).

The air quality on the measuring station Slavonski Brod-1 was I category with respect to NO₂, SO₂ and benzene, and II categories with respect to PM_{2.5}, O₃ and H₂S. At the measuring station Kopački rit, due to insufficient data coverage categorization of air quality with respect to PM₁₀ and PM_{2.5} was not made, and air quality with respect to O₃ was II category conditionally, because data coverage was less than 90%. The air at the station Zoljan was I category with respect to all measured parameters (SO₂, NO₂ and PM₁₀). The air quality on the measuring station Osijek-1 was I category with respect to the NO₂, CO and SO₂, and II category with respect to PM₁₀.

As it can be seen, the higher concentration of dust particles (PM₁₀, PM_{2.5}) are associated to the cities (Osijek, Slavonski Brod), most likely as a result of the transport system. Higher levels of H₂S in Slavonski Brod is related to the operation of the refinery in Bosnia and Herzegovina (Bosanski Brod). In whole Croatia, as well as in most other countries in Europe, only a portion of total deposition and ground-level ozone comes from their own sources. Therefore, solving ozone problem in Croatia depends largely on reducing emissions in other, especially neighbour countries, so Croatia has to be interested in successful implementation of obligations under international agreements and cooperation with these countries.

Interestingly, EEA State of Environment Report²⁶ in 2010 pointed out that ammonia concentrations in the region of Slavonia, eastern Croatia, were twice the national average. Significant sources of ammonia emissions are agriculture and animal husbandry, which are dominant in the eastern Croatia (Slavonia) region. Transboundary air pollution movement from neighbouring countries, particularly from Serbia and Hungary considerably contributes to increasing values acidification and eutrophication compounds in the area of eastern Croatia.

Serbia

Environmental protection agency has the National register of pollution sources while local governments have local registers.

Concentrations of suspended particles of nitrogen dioxide are dominant polluting matters that determine the air quality in Serbia.

During 2012 Agency for environmental protection implemented the operative monitoring for air quality in the network of automated stations for air quality tracking.

In Vojvodina zone during 2012 air was in the first category, that is, clean or with minor pollution because the measurements in all stations showed no over the limit values for any of the parameters. This also applies for the city of Novi Sad which is the biggest city in these districts. The same results are obtained for several cities in the designated districts, such as, Loznica and Sombor.

3.8 Hazardous waste and pollution hotspots

The situation analysis for the HR-RS IPA CBC programme 2014-2020 notes that out of total of 13 environmental 'hot spots' in Croatia, one is situated in the programme area – Borovo factory near Vukovar which is in remediation since 2010. However, in the Serbian part of programme area, more following environmental hot spots have been identified by the programming team:

- Revitalization of the Grand Bačka Canal in Kula and Vrbas
- Unregulated landfill reclamation projects (illegal dumping – there are 10-20 in all municipalities
- Construction of regional landfill in Subotica
- Construction of regional landfill in Novi Sad
- Construction of regional landfill in Sombor
- Construction of waste water treatment plants in Apatin, Bačka Palanka (all cities along the Danube)
- Mine and smelter - regional landfill in Zajaca – Loznica
- Chemical factory Zorka Sabac - industrial landfill

²⁶ http://www.eea.europa.eu/soer/countries/hr/soertopic_view?topic=air%20pollution

- Textile factory Obnova Sabac - industrial landfill

Other priorities include identification of hazardous industrial waste landfills and environmental audit of brownfield sites.

3.9 Cultural heritage

Croatia

Rich cultural heritage of Eastern Slavonija is consequence of permanent inhabitation since prehistory to modern age. Through the history in this area are overlaid impacts of prehistory cultures, Thracians, Illyrians, Celts, Romans, Goths, Huns, Avars, Hungaryans, Turks, Slavs and Germans. Material elements of cultural heritage are diverse and came from all periods of human residence in this area.

Prehistory artefacts and archaeological sites covering the period from Neolithic, Eneolithic, bronze Age and Iron age. They are extremely important archaeological finds regarded to cultures of Neolithic and Eneolithic: Starčevo, Sopot, Vučedol, Lasinja, Baden, Vatin and Urn fields culture.

The Antiquity is marked with strong influence of Roman civilization circle. Since the Eastern Slavonija was the part of Roman province Pannonia the area is rich with findings of military and civilian character with Roman civilization mark.

Migration period is source of diverse archaeological findings which vary from jewelry, weaponry and use objects. These items originate from different nations and tribes who have made shorter or longer lasting presence in the region of Slavonia. Because constant military threats main legacy of the Middle ages are remains of fortified towns and buildings.

The Ottoman conquest are destroyed most of the traces of previous cultures. This is almost main reason of relatively small number of surviving cultural heritage elements especially from the period shortly before 16th and 17th century. After withdrawal of Ottoman empire begins the period of Baroque and Catholic restoration which results with large number of sacral and secular artefacts. Except buildings important elements are church inventory (liturgy equipment, paintings, statues), written documents and chronicles. Strong development of all kind of arts is taking place in 19th and 20th century. From this period are preserved numerous examples of secular and religious architecture, paintings and sculptures, liturgical equipment, gardens and urban structure, photographs, manuscripts and archive materials, arts and crafts and industrial heritage. This period present numerous styles such as classicism, historicism and Art Nouveau.

Important part of slavonian cultural heritage is traditional culture. That include all spheres of country living: husbandary, handicraft, furniture, clothing, and amateur naive art. Folk customs, crafts and art are source of intangible cultural heritage, such as Bećarac – humorous form of folk songs and spring procession of the women's folklore group Ljelja. Both practises are protected as UNESCO intangible cultural heritage.

Cultural landscapes in Eastern Slavonija are witnesses of historical, economic and natural conditions. As such they are also in conflict with the modern processes of industrial and intensive agricultural development

The main responsibility for cultural heritage protection is given to regional conservation departments. In the case of Eastern Slavonia these departments are: Požega, Osijek, Slavonski Brod

and Vukovar. Except the conservation departments cultural heritage protection is implemented in spacios-planning documentation. Through the institution and spacios planning work are defined categories: protected, securely protected, proposed for protection, proposed for protection of local character and categorie of recognized cultural heritage.

The current state of cultural heritage indicates a continuous process of protection and renewal which are partly compounded by internal and external factors. It should be emphasized: the recent war devastations, insufficient technical capacity, lack of menagment models, abandoning traditional customs and crafts. Despite this area of Eastern Slavonia is rich in all kinds of cultural heritage elements.

Serbia

The protection and presentation of immovable cultural goods is done by the Institutes for protection of cultural monuments. In Vojvodina there are six of those institutions and in the designated districts are Provincial institute for monument protection in Petrovaradin, Inter-municipal institute for cultural monuments protection in Subotica, Institute for monument protection in Sremska Mitrovica, Institute for cultural monuments protection of the city of Novi Sad in Novi Sad.

Rich building heritage in Vojvodina in diversity of shapes and styles is a witness to a number of civilizations that have lived in this territory and left its trace in the past. According to the actual categorization of the immovable cultural goods in Vojvodina territory 424 immovable cultural goods are registered and are placed in several categories, many of which are in the designated districts and will be listed here.

Archeological findings

Sirmijum (1-4. century AD) – The settlement on this location dates even from Celtic period, and the earliest traces of settling go as far as 7000 years ago. Beneath the city itself were found the remains of imperial capital, dating from Antique period with the ruins of the great imperial palace, numerous residential and economic objects, temples and early Christian churches. Many localities in Sremska Mitrovica are yet to be inspected for archeological findings

- Čelarevo – Čibska forrest (8-9th century)
- Basijana near Ruma (antique period)

Objects with monument and cultural values – Monasteries and sacral objects

A unique complex of sacral heritage is located on Fruška Gora mountain where there used to be 35 and today there are 15 active orthodox monasteries that were founded between XV and XVIII century such as Novo and Staro Hopovo, KrušedoI, Grgeteg, Ravanica - Vrdnik, Jazak, Mala i Velika Remeta, Kuveždin, Divša (Đipša), Privina glava, Beočin, Rakovac, Šišatovac i Petkovica.

In Bačka are Monastery of Bođani and Monastery of Kovilj and in Bač is located the Franciscan Monastery and is the oldest monastic settlement in Vojvodina. According to documents it was built by templar knights in 1169. It was destroyed and burnt several times and thoroughly rebuilt in XVIII century. It is a mix of different architectural styles due to its numerous renovations.

Castles and Forts

The most important object in this category is Petrovaradinska tvrđava, a masterpiece of military architecture, located on the right bank of Danube, and was built between 1690. and 1780. Today it is the only fort of this type in Europe that is completely preserved. The most important and beautiful castles and summerhouses are located in Čelarevo, Sremska Mitrovica, Sremska Kamenica and fort in Bač dating from XIV century.

Old city cores

The most notable is the old city core of Sremski Karlovci, 15 km away from Novi Sad, with a rich complex of sacral, educational and other objects making it a place of special value. On the hill above is located the Chapel of Peace built in 1817. Other old city cores of importance are in Sombor, Subotica and Novi Sad.

4 CONSISTENCY OF THE PROPOSED PROGRAMME WITH THE RELEVANT ENVIRONMENTAL PROTECTION OBJECTIVES

This chapter analyzes relationship between the cooperation programme and the relevant environmental objectives and actions established at the EU level. When doing so, it suggests opportunities for enhancing synergies between environmental actions proposed in this cross-border cooperation programme and regional territorial cooperation on environmental matters.

As mentioned in the chapter 1.2, the cooperation programme is meant to contribute to and interact with the EU Strategy for Danube Region (primary point of reference on regional environmental matters) and the EU Strategy for the Adriatic and Ionian Region (secondary point of reference due to only indirect relationship to the proposed CBC programme).

Primary appraisal: Consistency of the proposed cooperation programme with the environmental targets of the EU Strategy for the Danube Region

The key environmental reference framework for the proposed Croatia-Serbia IPA CBC Programme 2014 - 2020 are the priorities defined in the environmental pillar of the EU Strategy for the Danube Region. EUSDR environmental pillar focuses on three Priority Areas which have to be integrated with other policies:

- Restore and maintain the quality of waters;
- Manage environmental risks;
- Preserve biodiversity, landscapes and the quality of air and soil.

The specific objectives for the above priority areas which are relevant for the programme area are:

1. Achieve the management objectives set out in the Danube River Basin Management Plan - i.e. achieve: a. good ecological/chemical status of surface water bodies; b. good ecological potential and chemical status of Heavily Modified Water Bodies and Artificial Water Bodies; and c. good chemical/quantitative status of groundwater bodies.
2. Reduce the nutrient levels in the Danube River to allow the recovery of the Black Sea ecosystems to conditions similar to 1960s.
3. Implement Danube wide flood risk management plans - due in 2015 under the Floods Directive – to include significant reduction of flood risk by 2021, also taking into account potential impacts of climate change”.
4. Update of the accidental risk spots inventory at the Danube River Basin level by 2013
5. To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement, adapted to the special needs of the Danube Region by 2020”.
6. Secure viable populations of Danube sturgeon species and other indigenous fish species by 2020”.
7. Reduce by 25% the area affected by soil erosion exceeding 10 tonnes per hectare by 2020”.
8. By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems”.
9. By 2020, Invasive Alien Species and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new Invasive Alien Species”.

The above 9 specific objectives have been used as the primary environmental policy objectives which are relevant for the proposed cooperation programme. The proposed cooperation programme was

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appraised against the above specified 9 targets, focusing largely on the Thematic Priority 2 which has the greatest linkages to environmental pillar of the EU Strategy for the Danube Region. The assessment and recommendations are provided in the table below. The following colours indicate relationships found:

- Direct, strongly supporting relationship
- Direct, strongly contradicting relationship
- Indirect, possibly supporting relationship
- Indirect, possibly contradicting relationship
- No relationship

Table 4: Relationship between results of the proposed programme and environmental targets under EU Strategy for Danube Region

Types of actions to be implemented	Environmental targets under EU Strategy for Danube Region									Comments and recommendations	
	1	2	3	4	5	6	7	8	9		
Specific Objective 2.1											
Implementing joint actions in the area of monitoring and management of environmental and/or biodiversity protection											1. Monitoring and management responses should focus specifically on priority issues addressed by the Danube River Basin Management Plan and the EU Strategy for the Danube Region (EUSDR) where more information is needed from the region: i.e. ecological and chemical status of water bodies, source of water pollution, ground-water pollution and accidental risk spots inventory, indigenous species (especially Danube sturgeon species), status of all species and habitats covered by EU nature legislation, and invasive species. Improvements of monitoring systems should primarily entail exchange of information and making it publicly available - new monitoring systems should be set up only when really needed. Monitoring system should be coordinated with bodies in charge of Danube River Basin Management Plan (i.e. ICPDR) - in terms of issues addressed, exact parameters monitored, monitoring periods and data formats.
Developing and implementing joint management initiatives in relation to emergency preparedness with focus on risk prevention and mitigation as response to natural disasters (floods, draughts, fire, etc).											2. Interventions on flood risks should be closely coordinated with Danube wide flood risk management plans and should also take into account potential impacts of climate change. Both of the proposed measures should ideally support implementation of Danube wide flood risk management plans due in 2015 under the Floods Directive. 3. The proposed measures should follow the following priority principles

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Types of actions to be implemented	Environmental targets under EU Strategy for Danube Region									Comments and recommendations
	1	2	3	4	5	6	7	8	9	
Developing and implementing pilot and demonstration projects including innovative technologies to enforce for risk prevention and mitigation.										<p>stipulated within the Action Programme for Sustainable Flood Protection in the Danube River Basin:</p> <ul style="list-style-type: none"> • To reduce the adverse impact and the likelihood of floods in each sub-basin through the development and implementation of a long-term flood protection and retention strategy based on the enhancement of natural retention as far as possible • To improve flood forecasting and warning suited to local and regional needs as necessary. • To increase the capacity building and raise the level of preparedness of the organizations responsible for flood mitigation • To develop flood risk maps • To harmonize design criteria and safety regulations along and across border sections. • To prevent and mitigate pollution of water caused by floods. <p>Monitoring of environmental risks management and emergency preparedness should be made available to authorities that are involved in Danube FLOODRISK Atlas mapping (2012) so that the data obtained can be potentially used in follow-up mapping and management plans or other interventions related to risk inventories at the Danube River Basin.</p>
Developing and implementing joint plans for protection of endangered species and protection and revitalisation of habitats.										<p>4. Both interventions should ideally focus on priority issues addressed by the EUSDR. Where possible, interventions related to biodiversity conservation should support measures related to implementation of locally specific measures in the programme area related to establishment of UNESCO Biosphere Reserve The Mura-Drava-Danube which is implemented within the European Commission's Strategy for the Danube Region.</p>
Joint valorisation and promotion of ecosystems and NATURA 2000 sites in the programme area										
Developing and implementing joint awareness raising										<p>5. Both interventions should ideally focus on priority issues addressed by the EUSDR - i.e. ecological and chemical status</p>

Types of actions to be implemented	Environmental targets under EU Strategy for Danube Region									Comments and recommendations
	1	2	3	4	5	6	7	8	9	
activities, information campaigns, education and training in relation to environment and/or biodiversity protection.										of water bodies, source of water pollution, ground-water pollution and accidental risk spots inventory, indigenous species (especially Danube sturgeon species), status of all species and habitats covered by EU nature legislation, and invasive species
Promoting cross-border cooperation between organisations involved in environmental and biodiversity protection and joint management of protected sites and nature										
Establishing and/or improving green infrastructure and ecosystem services										None

The above analysis revealed that the proposed programme through its Specific Objective 2.1 established a very good basis for addressing all key environmental priorities of the EUSDR which are relevant for the programme area. Nevertheless, there is a scope for improving linkages by directly addressing EUSDR environmental priority issues which are directly important for the study area. This is especially important for:

- Implementing joint actions in the area of monitoring and management of environmental and/or biodiversity protection
- Developing and implementing joint management initiatives in relation to emergency preparedness with focus on risk prevention and mitigation as response to natural disasters
- Developing and implementing pilot and demonstration projects including innovative technologies to enforce for risk prevention and mitigation.

Secondary appraisal: Consistency of the proposed cooperation programme with the environmental targets of the European Union Strategy for the Adriatic and Ionian Region

The EU Strategy for the Adriatic-Ionian Region (EUSAIR) is described in two documents: in a Communication from the European Commission to the other EU Institutions, and in an accompanying Action Plan²⁷ which outlines actions which are at the responsibility of all relevant actors at country, regional, and local/municipal level within each participating country. The Action Plan suggests examples of targets to be achieved by 2020.

The Action Plan is conceived to be rolling - this means that new actions may be added as needs change over time while existing actions are adapted as they move closer to completion. The adopted

²⁷ COM(2014) 357 final

Action Plan includes 'Environmental Quality' component which is of relevance to this SEA and which suggests the following indicative targets:

Table 5: EU Strategy for the Adriatic-Ionian Region indicative Environmental Quality targets

Priority concerns	Examples of targets to be achieved by 2020
Threat to coastal and marine biodiversity	<ol style="list-style-type: none"> 1. Establishment of a common infrastructure platform with participation of all countries for data collection, research, and laboratory analysis by end of 2015 2. 10% surface coverage of Adriatic and Ionian Seas by marine protected areas 3. Adoption of maritime spatial planning and integrated coastal management strategies by EU Member State by 2017 and for coastal candidate and potential candidate Countries by 2018 4. Achieving Good Ecological Status of the Adriatic and Ionian Seas by 2020 5. Enhancement of a marine NATURA 2000 network and a coherent and representative network of marine protected areas under the Marine Strategy Framework Directive by 2020
Pollution of the sea	<ol style="list-style-type: none"> 6. Reduction of marine litter in line with Marine Strategy Framework Directive and 7th Environment Action Programme targets by 2020 7. Reduction of anthropogenic nutrient flows to the Adriatic and Ionian seas to ensure that by 2021 eutrophication is minimised 8. A joint contingency plan for oil spills and other large scale pollution events adopted by 2016 and measures to enable joint and coordinated emergency response implemented by 2020
Transnational terrestrial habitats and biodiversity	<ol style="list-style-type: none"> 9. Establishment of transnational management plans for all terrestrial eco-regions, shared by two or more participating countries 10. Enhancement of NATURA 2000 and Emerald networks in the Region

Source: European Commission, SWD(2014) 190 final

The above two specific targets have been used as the secondary environmental policy objectives which are relevant for the proposed cooperation programme. The appraisal has again focused largely on the proposed Thematic Priority 2 which is the most relevant in terms of logical linkages between the planned interventions. The table below indicates relationships found and accompanying recommendations for consideration.

Table 6: Relationship between results of the proposed programme and environmental targets under the EU Strategy for the Adriatic-Ionian Region

EUSAIR indicative targets	Relationship with the proposed Croatia-Serbia IPA CBC 2014-2020	Recommendations
Establishment of transnational management plans for all terrestrial eco-regions, shared by two or more participating countries	<p>The cooperation programme directly addresses these EUSAIR targets through the following proposed types of actions:</p> <ul style="list-style-type: none"> • Developing and implementing joint plans for protection of endangered species and protection and 	If the programme wishes to demonstrate support to Environmental Quality pillar of the EUSAIR, it may be beneficial to consider activities related to protection of resting sites for

<p>Enhancement of NATURA 2000 and Emerald networks in the Region</p>	<p>revitalisation of habitats.</p> <ul style="list-style-type: none"> • Joint valorisation and promotion of ecosystems and NATURA 2000 sites in the programme area • Establishing and/or improving green infrastructure and ecosystem services 	<p>migrating birds on the Adriatic flyway which belongs to EUSAIR priorities actions to be taken under the its Action Plan. of the (such as Kopački Rit).</p>
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The conclusion is that the proposed cooperation programme directly addresses the relevant EUSAIR environmental quality targets and there is no need for adjustments.

5 EXPECTED ENVIRONMENTAL IMPACTS, ASSUMPTIONS AND OPPORTUNITIES FOR MITIGATION AND ENHANCEMENT

This chapter presents the expected effects of proposed programme on the environment. It focuses on the following key categories of potential environmental impacts of the proposed programme that were identified during the scoping process and during preparation of baseline analyses that further refined our understanding of the possible issues of concern that are associated with the proposed interventions:

- Greenhouse gas emissions
- Climate change adaptation and risk management
- Water quality
- Air Quality
- Soil
- Biodiversity, fauna, flora
- Cultural heritage including architectural and archaeological heritage, landscape
- Population and human health
- Possible synergistic and cumulative effects

Each of these impact categories are presented below. The presentation offers a broad overview. It lists interventions that are expected to achieve positive or adverse impacts and outlines assumptions behind these expectations. If identified impacts were deemed significant, the analysis also presents the main characteristics of such impacts without being speculative - i.e. it does not present possible impacts that may occur under purely hypothetical assumptions, neither it provides details of such impacts that cannot be established due to lack of information on locations and nature of proposed activities.

In order to facilitate consideration of options for mitigation and enhancement, the impact presentation is directly combined with an overview of measures that can be deployed to avoid or minimize the risks and increase the positive impacts of the proposed actions.

5.1 Greenhouse gas emissions

The proposed IPA CBC programme is expected to have positive impacts on both climate change adaptation and mitigation efforts in the programme area.

Expected positive effects

The programme will contribute to reduction of emissions of greenhouse gases through the following activities under its Specific Objective 2.2:

- Developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency.
- Implementing awareness rising, information campaigns, education, training and capacity building on sustainable energy production, utilisation of renewable energy resources and energy efficiency.
- Investing in joint infrastructure on sustainable energy and energy efficiency
- Implementing joint incentives in order to improve legal framework in the area of renewable energy resources and energy efficiency (e.g. analyses, comparisons, recommendation, local/regional action plans, etc).

Further on, the proposed interventions under the Specific Objective 7.1 that aim to improve competitiveness of the programme area through enhancing research, development, innovation and business support actions may support innovations in technologies, processes or logistical systems that effectively reduce current uses of materials and energy resources and indirectly contribute to reductions of greenhouse gases. Given the small scale of funding, **impacts of these interventions of reduction of greenhouse gasses in the programme area likely to be marginal.**

In order to enhance the positive effects of the proposed programme to local efforts to reduce emissions of green-house gasses, it is suggested to consider:

- prioritizing energy efficiency measures for public buildings (such as hospitals, schools) where possible synergies with interventions under Thematic Priority 1 Employment, Social Inclusion, Health and Social services exist.
- prioritize the use of agricultural waste for energy (which may achieve positive impacts also on waste management and the water quality) and also small-scale solar power (on roofs and built surfaces).

Risks of adverse impacts

There are no interventions proposed in the CBC programme that are expected to lead to increased emissions of greenhouse gases.

5.2 Climate change adaptation and risk management

Expected positive effects

The proposed cooperation programme is expected to contribute to climate change adaptation efforts. Most positive impacts can be expected especially from the following interventions under the Specific Objective 2.1:

- Developing and implementing integrated risk management initiatives addressing key existing and expected risks in the programme area (floods, flushing of land mines during flood events, draughts, toxic pollution accidents, etc).
- Developing and implementing pilot and demonstration projects including innovative approaches to risk prevention and mitigation.

In order to ensure the above interventions achieve positive impacts on climate change adaptation and risk management efforts, it is important to ensure that they are linked to larger-scale and long-term risk protection planning for the programme area (mainly flooding and industrial accidents). **This is an significant concern that requires attention.**

In this regard, it is recommended that interventions on flood risks should be closely coordinated with Danube and Sava basin flood risk management plans and should also take into account potential impacts of climate change. Both of the proposed measures should ideally support implementation of Danube wide flood risk management plans due in 2015 under the Floods Directive. Alternately, flood protection measures can support implementation of priority measures endorsed through ICPDR's Sub-Basin Level Flood Action Plan for Pannonian Southern Danube (2009) - i.e.:

- Spatial planning (Preparation of flood risk maps, Ensuring that spatial plans contain flood hazard maps, Defining limitations related to land use in flood prone areas)
- Enhancing retention and detention capacities (Preserving - and where possible enhancing - existing capacities of natural flood retention capacities)

- Non-structural preventive measures: (Introducing principles of EU Floods directive to decision-making, Capacity building of professionals, Raising awareness and preparedness of general public (Raise awareness and preparedness of general public)

Potential adverse impacts

Leaving the above concerns about the necessity to coordinate the local planning for flood prevention with flood management strategy for the entire basin, the proposed CBC programme does not include any additional activity that would constrain capacity for the natural flood passage through the programme area.

Activities with indirect positive effects on resilience to extreme climatic events and disasters

Activities related to energy saving schemes under Specific Objective 2.2 can easily increase resilience of the programme area to climate change, especially if energy saving interventions include increased insulation of public buildings and hence achieve both climate change mitigation and adaptation objectives. In this regard, it is suggested to prioritize support to hospitals and schools.

Interventions related to improvement of health and social support services under Specific Objective 1.1 will also have positive impacts on the resilience of the study area in case of extreme climatic conditions (such as heat strokes or floods). In this regard, it is suggested to prioritize support to those facilities that are easily accessible even in the case of natural disasters (i.e. their access routes are not cut-off by floods, etc.). Such consideration would also enhance possible synergies with interventions related to risk management under the Specific Objective 1.1.

5.3 Air Quality

The proposed CBC programme **does not contain any activity that is expected to cause significant positive or adverse impacts on air quality**. The only impacts that might occur are associated with the activities on promotion of renewable energy under the Specific Objective 2.2,

These interventions may - if inappropriate technologies for the energetic use of biomass would be supported - worsen the air quality. Given the limited scale of funding allocated to these interventions under the programme Specific Objective 2.2, the risk of such impact is very low and effects of any supported infrastructure for 'sustainable energy' on air quality can be safely managed through EIAs and/or standard environmental permitting processes.

In order to ensure that this takes place, we reiterate the need to ensure that the project selection mechanisms guarantees that any supported projects meet applicable air quality protection standards and are subject to applicable environmental impacts assessments if such are requested for the facilities proposed under the national legislative framework.

5.4 Soil

The proposed cooperation programme is **not expected to cause any significant risk of adverse impacts on soil quality**.

The only adverse impacts on soil could occur under Specific Objective 2.2 and be associated with development of 'sustainable energy' options based on extensive biomass farming. Possible promotion of biomass farming for energetic use may have adverse impacts on soil properties

(especially increased erosion and pollution by pesticide residues), depending on the type of crops chosen. In this regard, it appears useful to consider targeted support to elaboration of renewable energy plans in countries that wish to promote use of 'sustainable energy' and their optimizing through SEA processes. Such plans may address wider issues - such as impacts on biodiversity, soil, water pollution - that could be associated with uptake of various options for future uptake of renewable energy in the programme area.

The programme may on other hand have positive impacts on soil quality by supporting under Specific Objective 2.1 activities for 'Developing and implementing pilot and demonstration projects including innovative technologies to enforce for risk prevention and mitigation' that may address issues related to pollution resulting from floods (soil contamination with pollutants that may be flushed under various flood scenarios), industrial accidents (such as spillage), past environmental liabilities and other hazards (such as mines). In this regard, it is suggested to coordinate all concerns related to various risks into a single disaster risk prevention and management system that would respect also requirements of the EU Floods Directive and mapping of various water pollution hazards in the flood zones. Integrating information on various risks would be an effective tool setting priorities and making further technical, financial and political decisions regarding integrated risk management.

5.5 Water quality

The proposed IPA CBC programme Croatia-Serbia can have mixed indirect **impacts on water quality** which **can be both either minor positive or adverse, and minor or significant** - depending on the choice of the specific activities that will be actually supported during the programme implementation. The proposed programme does not have any strong direct relationship - either conflicting or synergistic - with objectives and measures prescribed within Croatian River Basin Management Plan (OG 82/13) and Water Management Strategy (OG 91/08) .

Expected positive effects

The programme may trigger some positive indirect impacts on water quality through implementation of activities 'Developing and implementing integrated risk management initiatives addressing key existing and expected risks in the programme area (floods, flushing of land mines during flood events, draughts, toxic pollution accidents, etc)', 'Developing and implementing pilot and demonstration projects including innovative technologies to enforce for risk prevention and mitigation' and 'Promoting cross-border cooperation between organisations involved in environmental and biodiversity protection and joint management of protected sites and nature' under the Specific Objective 2.1. These activities may comprise actions addressing various water pollution hazards in the programme area.

Potential mixed - positive or adverse - effects

Activities on 'sustainable energy production' supported under Specific Objective 2.2 may have mixed effects on water quality, depending on the types of actions that will be actually supported. Below is a summary of key possible impact that we found:

- Potential support to energetic use of agricultural waste can achieve some positive local impacts on water quality by reducing leachate that are normally associated with disposal of manure, provided that appropriate technologies are chosen and well managed. In this regard, we suggest to prioritize such projects in case suitable applications arise

- Potential support to uptake of biomass farming for fuel or energy production may on other hand easily lead to increased pollution of surface and ground water bodies by fertilizer and pesticide residues. Any intervention supporting biomass farming should ensure that production of these crops takes place only on lands which are: not erosion prone, not directly adjacent to water bodies, maintain sufficient riparian buffer zone from water courses and strictly adhere to principles of sound farming practices (with regard to fertilizer and pesticide use). Any larger-scale promotion of biomass farming should be permitted only if it can be proved that it will not lead to the deterioration of already achieved state of any water body surface and groundwater (which is e.g. a fourth objective of Croatian River Basin Management Plan). Biomass farming should not be supported on vulnerable areas under Nitrate Directive, unless the proponents of those projects can prove that the choice of crops and farming practice will not increase fertilizers and pesticides loads.
- Potential support to small- hydropower²⁸ may have adverse impact on water quality (especially sediment flows) which should be managed through application of EIA (in case of individual projects) or SEA (in case of possible provision of support to cascade of hydropower projects within one basin).

In this regard, we suggest to support renewable energy strategies or plans in those counties that wish to consider significant uptake of 'sustainable energy' and that these strategies are subject to thorough environmental scrutiny through SEA.

5.6 Forests

The programme is not likely to **have significant effects on forests and forestry**.

Potential adverse impacts could be associated with hypothetical larger-scale uptake of biomass farming for energetic use that would trigger conversions of current forest estates. Considering the budget of the cooperation programme, such expectation would be however highly speculative.

Yet, considering the unsatisfactory status of forests in Vojvodina and their low soil protection functions against winds and water erosion (see section 3.5), and poor quality of soils in Serbian part of the programme combined with risks of terrain instabilities (see Section 3.6), it appears useful to consider adding establishment of protection forests amongst the types of eligible activities that can be supported under Specific Objective 2.1.

5.7 Biodiversity, fauna, flora

The proposed programme is likely to **achieve positive impacts on biodiversity because of its interventions on biodiversity protection** (under Specific Objective 2.1) and preservation and sustainable use of natural heritage (under Specific Objective 4.1) **but also poses risks of adverse impacts to biodiversity with regard to interventions for flood management** (under Specific Objective 2.1), **promotion of sustainable energy** (under Specific Objective 2.2) **and support of tourism** (under Specific Objective 4.1).

Expected positive effects

²⁸ Due to the small scale of funding provided through this CBC programme, scale support to large hydropower plans is excluded from consideration

The Specific Objective 2.1 includes the following eligible activities that aim to directly promote biodiversity protection - i.e.:

- Implementing joint actions in the area of monitoring and management of environmental and/or biodiversity protection
- Joint valorisation and promotion of ecosystems and NATURA 2000 sites in the programme area
- Developing and implementing joint awareness raising activities, information campaigns, education and training in relation to environment and/or biodiversity protection.
- Promoting cross-border cooperation between organisations involved in environmental and biodiversity protection and joint management of protected sites and nature
- Establishing and/or improving green infrastructure and ecosystem services

It is assumed that nature protection authorities will be directly involved in implementation of these activities and they will ensure that no adverse impacts that could hypothetically arise from e.g. inappropriate designation or management of protected areas will occur. In order to maximize positive impacts of these interventions, it appears useful to prioritize activities related to establishment and sustainable management of planned UNESCO Biosphere Reserve Mura-Drava-Danube which is clearly the most important cross-border initiative related to nature protection in the programme area. This ministerial initiative is part of the EU Strategy for Danube Region. The character of proposed activities within IPA CBC Croatia-Serbia programme offers a suitable framework for supporting range of initiatives related to this cross-border Biosphere Reserve, especially on the Serbian side which awaits formal designation and where implementation needs are extensive given the large area involved. It would appear beneficial to pay increased attention to possible support to activities related to this Biosphere Reserve as long as they fit into logic of programme interventions and they demonstrate additionality to any ongoing projects that may be funded from other sources (EU, international or national). At the same time, the priority focus on UNESCO Biosphere Reserve Mura-Drava-Danube is not meant as exclusive and would not discriminate the wide territorial focus on the entire CBC programme area (i.e. interventions addressing other priority habitats that meet the programme criteria can be supported as well).

Potential adverse impacts

The programme Specific Objective 2.1 includes also the following activities which may - in the case of inappropriate implementation - may pose risks of adverse impacts to biodiversity:

- Developing and implementing joint management initiatives in relation to emergency preparedness with focus on risk prevention and mitigation as response to natural disasters (floods, draughts, fire, etc).
- Developing and implementing pilot and demonstration projects including innovative technologies to enforce for risk prevention and mitigation.

While it is assumed that no structural measures will be implemented within this CBC programme, there is still a risk that the supported activities may support measures that would affect riverine ecosystems or wider ecosystem of flood plains either directly (by altering natural habitats) or indirectly (by changing the water flow - depth or velocity). In this regard, it is recommended to support only ecosystem-based flood management strategies which integrate biodiversity and provision of ecosystem services into one overall approach to flood prevention and management. Priority attention should be given to actions that address the following six targets of the Action Programme for Sustainable Flood Protection in the Danube River Basin which follow the same logic and have been endorsed within the framework of the International Commission for Protection of Danube River:

- To reduce the adverse impact and the likelihood of floods in each sub-basin through the development and implementation of a long-term flood protection and retention strategy based on the enhancement of natural retention as far as possible
- To improve flood forecasting and warning suited to local and regional needs as necessary.
- To increase the capacity building and raise the level of preparedness of the organizations responsible for flood mitigation
- To develop flood risk maps
- To harmonize design criteria and safety regulations along and across border sections.
- To prevent and mitigate pollution of water caused by floods.

Other possible risks arise with regard to activities related to 'Developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency' and 'Investing in joint infrastructure on sustainable energy and energy efficiency' within the programme Specific Objective 2.2. Many renewable energy options cause potentially significant adverse impacts on biodiversity - e.g. well documented impacts of wind turbines on birds and bats, of biomass farming on habitat conversions and degradation of water ecosystems through increased erosion and nutrient and fertilizer loads, of large-scale installation of solar panels in landscape on birds, of hydropower plants on changes in the riverine ecosystems, sediment flows, fish migration, etc.

Generally, the biodiversity concerns surrounding possible future larger uptake of 'sustainable energy' in the programme area reiterate usefulness of preparation of renewable energy strategies or plans that fully take into account environmental constraints and risks and are subject to SEA. Even if direct funding for infrastructure is unlikely within the scope of this CBC programme, the general condition applies - that supported infrastructural activities must be subject to relevant permits, including any applicable EIA, assessment of impacts on Natura 2000 network (see chapter 6 for details) and possibly transboundary consultations if transboundary impacts are suspected.

The last series of interventions that may pose risks to biodiversity are activities for support of tourism under the programme Specific Objective 4.1.

- Joint development, branding and promotion of tourism niches: e.g. hunting, bird and animal watching, eco-tourism, sport and cycle-tourism, rural tourism.
- Joint development, branding, protection and promotion of new tourism products: e.g. development of thematic routes, joint promotion events and materials, site exploitation.
- Preparing and developing joint tourism strategies and action plans.

The above activities may affect biodiversity either directly through habitat changes or fragmentation (buildings, trails, access routes) or indirectly (through disturbance of species by visitors, use of unauthorised paths and shortcuts, littering, illegal collection of protected plant species, etc.). On the other hand, such activities contribute to environmental education of visitors and generate resources for sustainable management of protected areas by the residing human population. In order to reduce possible adverse impacts, it is recommended prioritize project that have been prepared in cooperation with nature protection authorities and adhere to the principles of EU Agenda for a sustainable and competitive European tourism such as: taking a holistic, integrated approach; planning for the long term; involving all stakeholders; recognizing, minimising and monitoring risks.

Needless to reiterate that any supported activities that may have impacts on Natura 2000 sites need to be subject to assessment of their effects on integrity of those sites in accordance with provisions of the Habitat Directive.

5.8 Cultural heritage including architectural and archaeological heritage, landscape

The programme is expected to have **positive impacts** on the cultural heritage, however it poses **some risks of adverse impacts** that should be addressed during selection of project applications.

Expected positive effects

The programme under its Specific Objective 4.1 includes the following activities that are designed with purpose of having positive impacts on cultural heritage:

- Developing and implementing joint initiatives on valuation, preservation, restoration and revitalisation of cultural and natural heritage sites
- Implementing training programs in quality assurance systems and different types of standardisation (e.g. ISO certification, etc.) of cultural and natural heritage.
- Deploying investments in certification including training, equipment supply but also small scale infrastructure on cultural and natural heritage.

The above measures are directly supporting the three strategic objectives for conservation, protection and commercial exploitation of the cultural heritage of Croatia defined in the Strategy of Conservation, Protection and Sustainable Economic Use of the Cultural Heritage of Croatia as follows:

- Increase the efficiency and effectiveness of protection and preservation of cultural heritage due to its sustainable use.
- Increase revenues and other benefits from the sustainable use of cultural heritage.
- Raise the level of awareness of individuals and communities about the importance of cultural heritage and sustainable use of cultural heritage.

Potential adverse impacts on heritage sites

It should be noted that although the above activities are expected to improve the state of the respective cultural heritage objects, they may - if inappropriately conceived - have unintended negative impacts by:

- adversely affecting physical aspects (tangible attributes) of the respective heritage objects by e.g. disrespecting the original design, degrading the site amenity through inappropriate access routes, use of inappropriate materials, damage during construction works, etc., or
- changing non-physical aspects (intangible attributes) related to use the culturally significant heritage properties that may be important for maintenance of local customs, spiritual purposes, and other traditional uses.

In order to ensure that none of these effects occur, the following generic recommendations have been formulated on the basis of common elements stipulated in the relevant international treaties and guidance²⁹ in order to guide planning of interventions for sustainable use of cultural and natural heritage under the Specific Objective 3.1.:

- Conservation plan must contribute to the authenticity and integrity of the sites and monuments and their tangible and intangible elements.
- Conservation plan must address all relevant factors necessary for adequate long-term safeguarding and sustainable use of the heritage site or monument. Management systems may

²⁹ World Heritage Convention (1972), Operational Guidelines for the Implementation of the World Heritage Convention (2013), International Charter for the Conservation and Restoration of Monuments and Sites (1964), Charter for the Conservation of Historic Towns and Urban Areas (1987), International Cultural Tourism Charter (1999), The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas (2011)

vary according to protection needs and the resources available and other factors. They may incorporate traditional protection and management, land-use planning approaches, and other planning control mechanisms, both formal and informal.

- The principal objectives of the conservation plan should be clearly stated. The proposals in the conservation plan must be articulated in a realistic fashion, from the legislative, financial and economic point of view, as well as with regard to the required standards and restrictions.
- The conservation plan should aim at ensuring a harmonious relationship between the heritage sites and monuments and the surrounding environment as a whole. Wherever necessary, an adequate buffer zone should be provided for the proper protection of the property.
- New functions and activities should be compatible with the character of the heritage sites and monuments.
- Before any intervention, existing conditions in the area should be thoroughly documented.
- The conservation plan should be supported by the residents of the historic area. Conservation planning should therefore encourage the active participation of the communities and stakeholders concerned with the property as necessary conditions to its sustainable protection, conservation, management and presentation.

It is also recommended to ensure that authorities in charge of cultural heritage protection are directly involved in implementation of these activities and that supported projects meet all applicable national rules for cultural heritage protection. Since the exact nature of the activities that will be supported and their locations is at this point unknown, it is impossible to further assess their possible impacts on specific cultural heritage sites or suggest any specific mitigation measures.

Potential adverse impacts on landscape

The programme also features under its Specific Objective 2.2. following activities related sustainable energy that may have adverse impacts on cultural and natural heritage:

- Developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency
- Investing in joint infrastructure on sustainable energy and energy efficiency

Inappropriate implementation of these activities that would e.g. promote large scale uptake of solar panels or wind power plants may have adverse impacts on amenity of cultural heritage and landscape. In this regard, we need to reiterate our previous recommendation about benefits of longer-term planning of 'sustainable energy' that integrates requirements for protection of environment, including natural heritage to enable conservation and maintenance of the significant or characteristic features of a landscape - justified by its heritage value derived from its natural configuration and/or from human activity - as required by the European Landscape Convention

Additionally, we again point out the necessity to ensure that proposed investment projects (if supported) obtain all applicable permits with regard to their possible impacts on cultural heritage site.

5.9 Population and human health

The programme is likely to have **indirect positive impacts on public health** because a number of actions proposed will positively influence the key core determinants of health defined by WHO³⁰. The key determinants that influence health status are: income and social status, education, physical environment and employment and working conditions, social support networks genetic, personal behaviour, and accessibility and quality of health services.

Direct positive impacts on health can be expected from all of the following interventions under programme Specific Objective 1.1:

- Developing and implementing lifelong learning programmes aiming to provide programme area inhabitants the possibility to gain knowledge / experiences / qualifications in the area of health and social care line with the labour market needs.
- Joint vocational / adult (youth) training projects addressing skills needs & sectorial needs in the area of health and social care
- Developing and implementing joint initiatives to improve accessibility to and effectiveness of public health care and social services and institutions (e.g. small infrastructure and/or equipment), including related pilot projects.
- Developing and implementing joint activities on enhancing the quality of health care and social care: e.g. joint health services delivery, active and healthy aging and disease prevention implementation plan, implementing small-scale infrastructure activities, etc.
- Implementing ICT solutions in order to improve public health and social care services
- Joint strengthening of health care for vulnerable groups with focus on elderly, palliative care and persons with disabilities.
- Networking of institutions in the area of enhancing health and social care facilities, services and skills.

The proposed programme features also additional interventions that may - depending on the exact modalities of their implementation - positively influence determinants of health. The most relevant interventions in this regard are:

- actions related to joint management initiatives in relation to emergency preparedness with focus on risk prevention and mitigation under programme's Specific Objective 2.1, and
- actions for developing and implementing joint initiatives on valuation, preservation, restoration and revitalisation of cultural and natural heritage sites programme's Specific Objective 4.1

The programme includes only one intervention under the Specific Objective 2. 2 - an activity 'Investing in joint infrastructure on sustainable energy and energy efficiency' - that may potentially cause indirect potential adverse health impacts if inappropriate technologies for energetic use of biomass or waste would be supported. The risks of such affects are however marginal, given the focus and the scale of funding under the proposed programme. Nevertheless, in order to ensure that such risks do not materialize, all supported projects must meet applicable environmental and health protection standards and be subject (when needed) to environmental impacts assessment based on the applicable national legislation. Additionally, it appears useful to consider support to targeted planning for future uptake of 'sustainable energy' in the programme area that would address relevant environmental, including health, concerns.

³⁰ This assessment uses WHO definition of health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' and operates with evaluation framework based on determinants of health as recommended by the UNECE Manual for the practical application of SEA Protocol.

5.10 Possible synergistic and cumulative effects

The SEA Directives requires assessment of impact interactions - i.e. synergistic and cumulative effects.

Cumulative effects are the results of individually minor but collectively significant effects on the environment taking place over a period of time. Due to the lack of information on the locations of proposed activities, it is impossible to determine whether any significant cumulative impact would arise. Given the nature of the proposed CBC programme, risks of such impact is negligible and if they do arise, they can be managed on project-by-project basis within the applicable permitting or EIA processes for proposed activities.

Synergistic effects arise when two or more impacts interact and produce an effect greater than the sum of their individual effects. The programme features two types of interventions that may cause possible synergistic impacts:

- Developing and implementing joint management initiatives in relation to emergency preparedness with focus on risk prevention and mitigation as response to natural disasters (floods, draughts, fire, etc) under Specific Objective 2.1. which may - if appropriate approach to flood management are promoted - cause combination of effects on biodiversity, Natura 2000 network and flood water passage.
- Developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and energy efficiency and Investing in joint infrastructure on sustainable energy and energy efficiency under Specific Objective 2.2. which might cause combined effects on biodiversity, Natura 2000 network, water quality, and cultural heritage and landscape - depending on the exact nature of 'sustainable energy' sources promoted, their locations and technologies used.

The above impacts are not expected to be a major source of concern and can be managed by adopting integrated recommendations summarized in the Chapter 7.

6 Appropriate Assessment for the Croatia-Serbia IPA CBC Programme 2014 - 2020

6.1 Characteristics of the ecological network areas

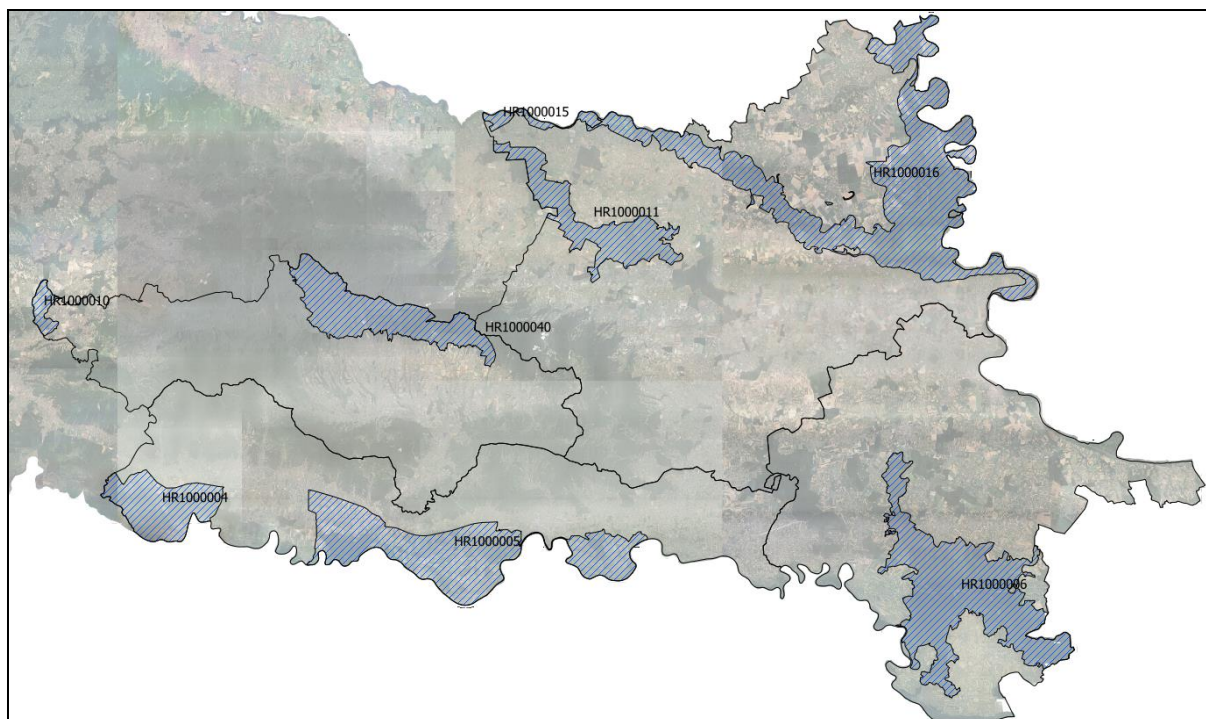
Croatian Ecological Network was established pursuant to the Regulation on the Ecological Network (Off. Gazette 124/13), and the designated areas are considered to be Natura 2000 areas. Ecological Network consists of the following areas:

- Areas important for bird preservation (*Special Protection Areas, SPA*) (Figure)
- Areas important for preservation of species and habitat types (*Special Areas of Conservation, SAC*). (Figure 1)

Ecological network encompasses approx. 37% of Croatian land territory and approx. 16% of the Croatian Adriatic. In total there are 780 areas, 742 SAC and 38 SPA areas.

The CBC Programme are includes territories of 4 eastern Croatian Counties: Osječko-baranjska, Vukovarsko-srijemska, Brodsko-posavska and Požeško-slavonska County. Within this area there are 8 SPA areas (Areas important for bird preservation) and 43 SAC areas (Areas important for preservation of species and habitat types). They are presented in the following figures and tables.

Figure 11: Ecological Network- areas important for bird preservation (Special Protection Areas, SPA) of the four Counties

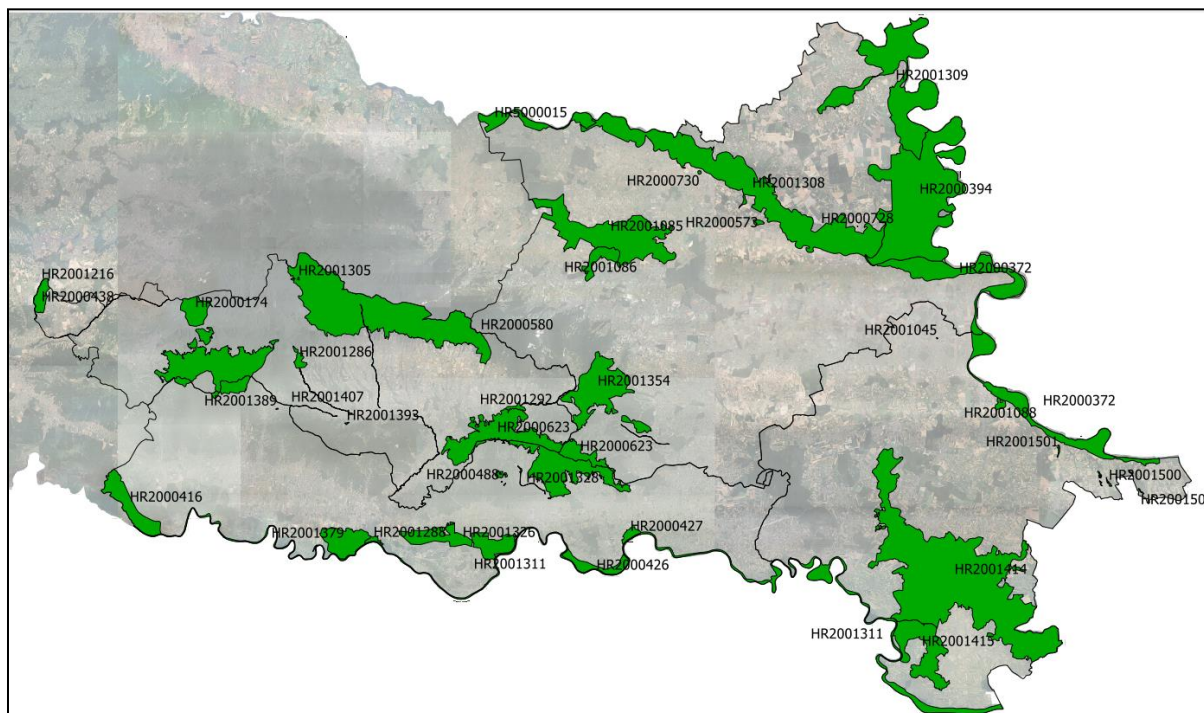


Source: State Institute for Nature Protection (WMS Service)

SITE CODE	SITE NAME	COUNTY
HR1000004	Donja Posavina	Brodsko-posavska
HR1000005	Jelas polje	Brodsko-posavska
HR1000006	Spačvanski bazen	Vukovarsko-srijemska

HR1000010	Poilovlje s ribnjacima	Požeško-slavonska
HR1000011	Ribnjaci Grudnjak i Našice	Osječko-baranjska
HR1000015	Srednji tok Drave	Osječko-baranjska
HR1000016	Podunavlje i donje Podravlje	Osječko-baranjska
HR1000040	Papuk	Požeško-slavonska, Osječko-baranjska

Figure 1. Ecological Network - areas important for preservation of species and habitat types (Special Areas of Conservation, SAC) of the four Counties



Source: State Institute for Nature Protection (WMS Service)

	SITE CODE	SITE NAME	COUNTY
1.	HR2000174	Trbušnjak - Rastik	Požeško-slavonska
2.	HR2000372	Dunav - Vukovar	Osječko-baranjska, Vukovarsko-srijemska
3.	HR2000394	Kopački rit	Osječko-baranjska
4.	HR2000416	Lonjsko polje	Brodsko-posavska
5.	HR2000426	Dvorina	Brodsko-posavska
6.	HR2000427	Gajna	Brodsko-posavska
7.	HR2000438	Ribnjaci Poljana	Požeško-slavonska
8.	HR2000488	Južni Dilj	Brodsko-posavska
9.	HR2000573	Petrijevci	Osječko-baranjska
10.	HR2000580	Papuk	Požeško-slavonska, Osječko-baranjska
11.	HR2000623	Šume na Dilj gori	Požeško-slavonska, Brodsko-posavska, Osječko-baranjska
12.	HR2000728	Biljsko groblje	Osječko-baranjska

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13.	HR2000730	Bistrinci	Osječko-baranjska
14.	HR2001045	Trpinja	Vukovarsko-srijemska
15.	HR2001085	Ribnjak Grudnjak s okolnim šumskim kompleksom	Osječko-baranjska
16.	HR2001086	Breznički ribnjak (Ribnjak Našice)	Osječko-baranjska
17.	HR2001088	Mala Dubrava - Vučedol	Vukovarsko-srijemska
18.	HR2001216	Ilova	Požeško-slavonska
19.	HR2001286	Orljavac	Požeško-slavonska
20.	HR2001288	Pričac - Lužani	Brodsko-posavska
21.	HR2001289	Davor - livade	Brodsko-posavska
22.	HR2001292	Livade kod Čaglina	Požeško-slavonska
23.	HR2001305	Zvečevo	Požeško-slavonska
24.	HR2001308	Donji tok Drave	Osječko-baranjska
25.	HR2001309	Dunav S od Kopačkog rita	Osječko-baranjska
26.	HR2001311	Sava nizvodno od Hrušćice	Brodsko-posavska, Vukovarsko-srijemska
27.	HR2001326	Jelas polje s ribnjacima	Brodsko-posavska
28.	HR2001328	Lonđa, Glogovica i Breznica	Požeško-slavonska, Brodsko-posavska, Osječko-baranjska
29.	HR2001329	Potoci oko Papuka	Požeško-slavonska
30.	HR2001354	Područje oko jezera Borovik	Požeško-slavonska, Osječko-baranjska
31.	HR2001355	Psunj	Požeško-slavonska, Brodsko-posavska
32.	HR2001379	Vlakanac-Radinje	Brodsko-posavska
33.	HR2001385	Orljava	Požeško-slavonska, Brodsko-posavska
34.	HR2001389	Banićevac	Brodsko-posavska
35.	HR2001393	Nurkovac	Požeško-slavonska
36.	HR2001403	Bijela	Požeško-slavonska
37.	HR2001407	Orljavica	Požeško-slavonska, Brodsko-posavska
38.	HR2001414	Spačvanski bazen	Vukovarsko-srijemska
39.	HR2001415	Spačva JZ	Vukovarsko-srijemska
40.	HR2001500	Stepska staništa kod Bapske	Vukovarsko-srijemska
41.	HR2001501	Stepska staništa kod Opatovca	Vukovarsko-srijemska
42.	HR2001502	Stepska staništa kod Šarengrada	Vukovarsko-srijemska
43.	HR5000015	Srednji tok Drave (od Terezinog polja do Donjeg Miholjca)	Osječko-baranjska

Because of the number of sites, within the four programme Counties, only general information regarding the areas was given in this chapter, while more detailed information is available at <http://natura2000.dzrp.hr/natura/>, and the list of the target species and/or habitats are given in the Regulation on the Ecological Network (Off. Gazette 124/13) - http://narodne-novine.nn.hr/clanci/sluzbeni/2013_10_124_2664.html.

6.2 Characteristics of the CBC programme implementation impacts on the ecological network

The Ministry of Environmental and Nature Protection, Directorate for Nature Protection issued a Decision (Klasa: UP/I 612-07/14-71/143, URBROJ: 517-07-2-14-3, Zagreb 1st of August 2014) in which is stated that it is not possible to exclude all likelihood of a significant negative impact on the Croatian Ecological Network that would arise from the implementation of the CBC Programme, and that it is necessary to prepare an Appropriate Assessment, as part of the SEA.

The Decision pointed out that **it is possible to exclude significant negative impacts** from:

- Priority axis 1: Improving the quality of social and health services in the programme area – specific objective *1.1 To improve facilities, services and skills in the area of health and social care*
- Priority axis 4: Enhancing competitiveness and developing business environment in the programme area – specific objective *4.1 To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area*

According to the current Programme draft activities of the priority axis 1 will include soft measures aimed at improving labour skills and employability of the residents, as well as social inclusion and services in the area of public health and social welfare. Priority axis 4 will include soft measures aimed at increasing competitiveness of SMEs in the programme area (social networks, SME cooperation, improving knowledge and skills, innovation and R&D, establishing laboratories, innovation, technological and competence centres, spin offs and ICT infrastructure).

The Decision also states that **it is not possible to exclude significant negative impacts** from:

- Priority axis 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency – specific objectives *2.1 To improve management systems for risk prevention and environmental and biodiversity protection, and 2.2 To promote use of sustainable energy and energy efficiency.*
- Priority axis 3: Contributing to the development of tourism and preserving cultural and natural heritage – specific objective *3.1 To strengthen, diversify and integrate the cross border tourism offer and better manage cultural and natural heritage assets.*

Since the Priority axes 2 and 3 include actions relating to the changes in land or resource use and nature management they could therefore have a negative impact on some of the Ecological Network target features.

Assessment Methodology

The methodology applied was described in the guidelines report General Guidance on SEA in Croatia - Annex 1: Considerations related to Appropriate Assessments³¹. Relating to these kind of programming document the Guidance states:

„Some other plans do not contain geographically localizable elements (e.g., some development strategies like county development strategy or tourism development strategy) but from their subject

³¹ This report has been prepared within EU-funded (IPA 2010) project 'Strengthening capacities for Strategic environmental assessment at regional and local level' headed by the Ministry of Environmental and Nature Protection and implemented by EPTISA Servicios de Ingeniería S.L. and Dvokut Ecro d.o.o

and description it is apparent that their implementation will be likely to have territorial impacts. Most such plans cannot factually be assessed as to their likely impacts on Natura 2000 due to the lack of localizable data; however, their environmental report should highlight the key risks that may be associated with the proposed interventions and have to always contain a reference to the need of detailed assessment of impacts of all their elements in the subsequent stages of planning or implementation process.”

The CBC programme is a framework document which will focus on achieving specific objectives in the programming area using grants from EU Funds (IPA). At this stage, only the programme area problems and desired outcomes of the programme implementation are known. The activities that will be financed in order to achieve the set goals, are only given in the CBC Programme as potential examples. This presents a problem for an Appropriate Assessment since it should then consider all potential projects that could be financed and their impacts. The precise strategic assessment is furthermore hindered by the lack of a spatial component of the programme (this in particular relates to the cumulative impact of the CBC Programme on the Ecological Network).

Because of the stated reasons the Assessment focused, following the above mentioned guidelines, on pointing out possible threats for the Ecological Network area cohesion or target features that could arise from potential project implementation.

In order to assess the potential impact of the programme an environmental goal was set, based on the EU³² and Croatian³³ regulations:

EN 1 Protect Ecological Network area cohesion and target features (both target species and target habitats).

Impact Assessment

PRIORITY AXIS 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency	
Specific objective 2.1. To improve management systems for risk prevention and environmental and biodiversity protection	
Possible impact	Impact significance
<p>Negative impacts can be caused by the risk prevention in relation to natural disasters (in particular floods and droughts), especially if the joint management or the pilot programs would include infrastructure.</p> <p>Potential flood prevention infrastructure, but also various possible joint management initiatives, can cause significant changes of the habitat conditions, especially the flood regimes, of several Ecological Network areas. These types of projects can have potential impacts on the underground aquifers and water tables, and through this a negative impact on the flood plain forests (target feature).</p>	<p>Negative influence can potentially be significant for river and swamp habitats and species (area target features) in the event of river canalization or dam (reservoir) construction. These types of projects can have a particularly negative impact when constructed within Ecological Network areas, how ever since their impacts are not localised but extend both downstream and upstream from the project location, their construction near Ecological Network areas can also have significant impact (if the area of the impact extends over the Ecological Network).. Dam construction can have a negative impact not only on the target features but also on the area integrity (significant habitat changes from riverine</p>

³² Council Directive 92/43/EEC of May 21st 1992 on the conservation of natural habitats and of wild fauna and flora, also known as the Habitats Directive, amended by Directive 2013/17/EU of May 13th 2013 regarding Croatian accession, and the Directive 2009/147/EC of the European Parliament and of the Council of November 30th 2009 on the conservation of wild birds, also known as the Birds Directive.

³³ Nature Protection Act (Off. Gazette 80/13), Regulation on bird target species and basic measures for their protection in Ecological Network area (Off. Gazette 15/14) and Regulation on the list of habitat types, habitat map and endangered and rare habitat types (Off. Gazette 88/14).

<p>Potential infrastructure for mitigating drought effects (irrigation system construction) can also have significant impacts on the habitat conditions as well as will lead to the changes in land use, in particular if they include reservoir construction (water source selection is also important). Intensifying agriculture activities, as a result, can have a negative impact on the locally present species through pesticide and fertilizer use (possible negative impacts on the water quality, both surface waters and underground waters).</p>	<p>ecosystem into reservoirs).</p> <p>Additional channel construction (for water wave relief) can have a slightly positive and local impact by creating new habitats that can add to area biodiversity.</p> <p>Irrigation system construction could have a significant negative impact if the system is located within or near Ecological Network areas.</p> <p>However, due to the limited budget, it is foreseeable that only small-scale infrastructure, if any at all, could be financed from the CBC Programmes and therefore the impacts from risk prevention activities are not expected to be significant. Still, due to the strategic assessment limitations, impact significance will have to be determined at the project level.</p>
<p>All potential activities included in the joint valorisation and promotion of ecosystems and Natura 2000 sites in the programme area will have a significant positive impact on the Ecological Network (i.e. Natura 2000 sites).</p>	<p>This positive effect will be the most significant for the Ecological Network areas on the border.</p>
<p>All potential activities included in the following actions: monitoring and management of environmental and/or biodiversity protection, protection of endangered species and protection and revitalisation of habitats, awareness raising activities, information campaigns, education and training in relation to environment and/or biodiversity protection, cooperation between organisations involved in environmental and biodiversity protection and joint management of protected sites and nature, establishing and/or improving green infrastructure and ecosystem services could potentially have positive impacts on the Ecological Network.</p>	<p>This positive effect will be the most significant if actions and activities would include endangered habitats and species, since they are usually included in the Ecological Network areas as target features.</p>
<p>Conclusion:</p> <p>Given the limited budget for this objective it is not likely it will include any flood prevention infrastructure construction, so the overall impact is not expected to be significant. However, given the above listed potential negative impacts it is important to use programme support for only such activities that will not have significant impacts on the Ecological Network. This means that only the least invasive protection measures, such as planning and construction of retention basins or improving emergency services preparedness and cooperation, joint forecasting and warning, rising local communities preparedness, should be supported through the Programme.</p> <p>Potential infrastructure for mitigating drought effects can have significant negative impacts on the Ecological Network, however this depends on the locations of irrigation systems and the chosen water sources. Since the Programme does not contain potential location, the overall significance of this action cannot be assessed with certainty.</p> <p>Other planned activities, aimed at biodiversity protection and management, will have to be executed by nature protection authorities, and therefore will have an overall positive impact on the Ecological Network, especially activities included in the joint valorisation and promotion of ecosystems and NATURA 2000 sites in the programme area.</p>	
<p>Mitigation measures / activity implementation prerequisites:</p> <ul style="list-style-type: none"> → Promote joint activities in the field of natural disaster forecasting and warning, rising emergency services and local communities preparedness → For all flood prevention activities potential impacts on the Ecological Network must be taken into account, and activities that are least invasive should be selected. It is therefore recommended to support only ecosystem-based flood management strategies which integrate biodiversity and provision of ecosystem services into one overall approach to flood prevention and management → Plan long-term flood protection and retention strategy based on the enhancement of natural retention whenever possible → All flood prevention projects, whenever possible, should be planned on locations where they will not have a negative impact on the Ecological Network target features or integrity → Irrigation systems planning /construction or reconstruction must take into account potential impacts on the Ecological Network 	

- Give preference to irrigation systems that are not planned or already located within or in the vicinity of Ecological Network areas
- Give preference to irrigation systems that do not require reservoir construction (especially not on the rivers) for their water source

PRIORITY AXIS 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency

Specific objective 2.2. To promote use of sustainable energy and energy efficiency.

Possible impact	Impact significance
<p>Negative impacts can be expected from developing and implementing pilot and demonstration projects on innovative technologies and solutions in the field of sustainable energy and investing in joint infrastructure on sustainable energy.</p> <p>Sustainable energy, in particular renewable energy resources are known to have various negative impacts on the biodiversity and are therefore likely to have negative impacts on the Ecological Network areas and their target features. Exploitation of wind energy can have negative impacts on bird and bat populations (deaths by wind turbines). Exploitation of river energy, by constructing hydropower plants, can have a significant impact on the riverine ecosystems and cause significant changes in the habitat conditions and through that influence all river species. Larger hydrotechnical projects can lead to changes of underground aquifers and water tables which in turn are important for flood plain forests. Large solar parks can have significant negative impacts on the bird population; however use of smaller numbers of solar panels does not exhibit such negative impacts (death by overheating etc.). Biofuel cogenerations in general do not have major impacts on the biodiversity; however this depends on their location and the manner in which they obtain biomass (biomass farming can cause land use changes and degradation of water ecosystems through increased erosion and increase in nutrient and fertilizer loads).</p>	<p>The significance of the potential negative impact depends on the scale of renewable energy projects and their location, and it cannot therefore be assessed with certainty on a strategic level. However, due to the budget allocation, it is not likely that any major project in renewable energy resources will be financed from this Programme, and therefore the impact is not expected to be significant.</p> <p>In addition, to minimize potential negative impacts from solar energy use, it is recommended that smaller scale projects are planned (use of several panels, rather than large parks) and that these solar panels are limited to already built urban area.</p>
<p>Conclusion:</p> <p>While sustainable energy use and energy efficiency are regarded as a positive approach to energy use, various methods of exploiting renewable energy resources have been noted to have negative impacts on the biodiversity, and are therefore likely to have a negative impact on the Ecological Network areas and their target features. This, however, greatly depends on the scale of the projects as well as on their locations. Since the CBC Programme does not give such details, the significance of the impact cannot be assessed on the strategic level and it will therefore have to be addressed on the project level. However, given the available budget for the interventions proposed, it is not likely that any large scale infrastructure for renewable energy will be financed from the CBC Programme, and therefore it is unlikely its implementation will have a significant impact on the Ecological Network.</p>	
<p>Mitigation measures / activity implementation prerequisites:</p> <ul style="list-style-type: none"> → Wind turbines and large solar parks should not be planned within areas important for bird preservation (Special Protection Areas, SPA). → Large solar parks and hydropower plants should not be planned within areas important for preservation of species and habitat types (Special Areas of Conservation, SAC) → It is recommended to finance smaller-scale solar power projects (use of several panels, rather than large parks). → Solar parks should be limited to already built urban areas. 	

PRIORITY AXIS 3: Contributing to the development of tourism and preserving cultural and natural heritage

Specific objective 3.1. To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets	
Possible impact	Impact significance
Development and diversification of the tourism offer and capacity, exploring various options for site exploitation, improvement of recreational and small-scale tourism infrastructure: e.g. walking paths, cycle routes, equipping visitor centre, information points, networking tourism centres, spatial "beautification" as well as developing various types of tourism are actions that can potentially have a negative impact on the biodiversity, and if set within the Ecological Network, on the area integrity and its target species.	The significance of the potential negative impact depends on the scale of projects and their location, and it cannot therefore be assessed on a strategic level. However, due to the limited budget, the impact is not expected to be significant. Planning such project outside of Ecological Network areas, would ensure that they do not have any adverse impact on the Ecological Network.
Investing in small scale infrastructure within protected nature areas (natural heritage sites) can have a negative impact on the Ecological Network, since often protected areas are also Ecological Network areas. This impact can include land use changes and changes habitat conditions as well as limiting flora and fauna species distribution area.	The significance of the potential negative impact will depend on the scale of projects and their proximity to area target features. For all National Parks and Nature Parks special spatial plans have to be prepared, and all infrastructure within them will have to be planned accordingly, which will reduce the possibility of a significant impact on the protected area (and on the Ecological Network).
Developing and implementing joint initiatives on valuation, preservation, restoration and revitalisation of natural heritage sites can have a positive impact on the Ecological Network (protected areas are often Ecological Network areas as well).	The significance of this potentially positive impact will depend on the actions undertaken and their location.
<p>Conclusion: Potential actions within the specific objective 3.1. can have both positive and negative impacts on the Ecological Network which due to the budget limitations are not likely to be significant. Since all infrastructure projects within protected nature areas have to be in accordance with the relevant spatial plans, and if visitor capacity of protected areas is carefully set and not exceeded, the negative impacts of the CBC would be minimal. It is advised to implement as many as possible evaluation, preservation, restoration and revitalisation of protected nature areas activities. Since the impact some of the potential projects cannot be assessed with certainty on the strategic level it will have to be done on the project level.</p>	
<p>Mitigation measures / activity implementation prerequisites: → It is necessary to ensure, in the project preparatory phase, that no important and protected habitats and species (target features) are endangered by the planned infrastructure.</p>	

6.3 Alternative solutions and their possible impact on the ecological network

The CBC Programme defined the priorities, measures and activities necessary for an affective Programme implementation in order to obtain the goals set out according to the situation/needs in the programme area. Given the character of the Programme, no alternatives were considered. Therefore the Appropriate Assessment focused on assessing potential impacts on the Ecological Network area and target features as well as on proscribing implementation criteria for potential types of actions. These criteria will assist in future project selection so that the Programme implementation does not endanger Ecological Network areas nor their target features.

6.4 Mitigation measures for the CBC programme implementation

The following mitigation measures are envisioned as project criteria which will ensure the protection of the Ecological Network integrity and its target features. Since the CBC Programme does not give specific project locations, the measures do not apply to specific Ecological Network areas or target features. Specific measures for all project that could potentially have negative impacts on the

Ecological Network will be put forth within the Appropriate Assessment on the project level, according to the Nature Protection Act. The following table shows the mitigation measures grouped according to the specific objectives and potential types of actions.

Mitigation measure	
PRIORITY AXIS 2: Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency	
2.1.	To improve management systems for risk prevention and environmental and biodiversity protection
General measure	Promote joint activities in the field of natural disaster forecasting and warning, rising emergency services and local communities preparedness
Risk prevention in relation to natural disasters (joint management and the pilot programs) - floods	For all flood prevention activities potential impacts on the Ecological Network must be taken into account, and activities that are least invasive should be selected. It is therefore recommended to support only ecosystem-based flood management strategies which integrate biodiversity and provision of ecosystem services into one overall approach to flood prevention and management
	Plan long-term flood protection and retention strategy based on the enhancement of natural retention whenever possible
	All flood prevention projects, whenever possible, should be planned on locations where they will not have a negative impact on the Ecological Network target features or integrity
Risk prevention in relation to natural disasters (joint management and the pilot programs) - mitigating drought effects	Irrigation systems planning /construction or reconstruction must take into account potential impacts on the Ecological Network
	Give preference to irrigation systems that are not planned or already located within or in the vicinity of Ecological Network areas
	Give preference to irrigation systems that do not require reservoir construction (especially not on the rivers) for their water source
2.2.	To promote use of sustainable energy and energy efficiency.
Sustainable energy (developing and implementing pilot and demonstration projects on innovative technologies and investing in joint infrastructure)	Wind turbines and large solar parks should not be planned within areas important for bird preservation (Special Protection Areas, SPA)
	Large solar parks and hydropower plants should not be planned within areas important for preservation of species and habitat types (Special Areas of Conservation, SAC)

Mitigation measure	
	It is recommended to finance smaller-scale solar power projects (use of several panels, rather than large parks).
	Solar parks should be limited to already built urban areas.
PRIORITY AXIS 3: Contributing to the development of tourism and preserving cultural and natural heritage	
3.1.	To strengthen, diversify, integrate the cross-border tourism offer and better manage cultural and natural heritage assets
General measures	It is necessary to ensure, in the project preparatory phase, that no important and protected habitats and species (target features) are endangered by the planned infrastructure

6.5 Conclusion on the CBC programme impact on the ecological network

Ecological Network of the programming area consists of 8 SPA areas (Areas important for bird preservation) and 43 SAC areas (Areas important for preservation of species and habitat types).

In the stage of the preliminary assessment it was possible to exclude significant negative impacts from:

- Priority axis 1: Improving the quality of social and health services in the programme area – specific objective *1.1 To improve facilities, services and skills in the area of health and social care*
- Priority axis 4: Enhancing competitiveness and developing business environment in the programme area – specific objective *4.1 To improve competitiveness of the programme area through strengthening cooperation between business support institutions, education and research organisations and entrepreneurs with aim to develop new products/services/patents/trademarks in the programme area*

According to the current Programme draft activities of the priority axis 1 will include soft measures aimed at improving labour skills and employability of the residents and social inclusion and services in the area of public health and social welfare. While priority axis 4 will include soft measures aimed at increasing competitiveness of SMEs in the programme area (social networks, SME cooperation, improving knowledge and skills, innovation and R&D, establishing laboratories, innovation, technological and competence centres, spin offs and ICT infrastructure).

However, the preliminary assessment did not exclude a possibility of significant negative impacts from:

- Priority axis 2 – specific objectives *2.1. To improve management systems for risk prevention and environmental and biodiversity protection* and *2.2 To promote use of sustainable energy and energy efficiency.*
- Priority axis 3 – specific objective *3.1 To strengthen, diversify and integrate the cross border tourism offer and better manage cultural and natural heritage assets.*

Since the Priority axes 2 and 3 include actions relating to the changes in land or resource use and nature management they could have an impact on some of the Ecological Network target features. The proposed actions can be implemented throughout the programming area, and the lack of data (spatial, project scale and number) makes the assessment of the Programme impact on particular Ecological Network areas and target features impossible, as well as hinders the assessment of the impact significance or potential cumulative effects of the Programme implementation.

The assessment, however, has pointed out that potentially the most significant impact on the Ecological Network would arise from large scale infrastructure projects (flood prevention, irrigation systems, renewable energy resources), which in turn are not likely to be financed from the CBC Programme primarily due to the budget limitations.

All projects/activities that will apply for funding under Priority axes 2 and 3 and that could potentially have a significant impact on the Ecological Network will have to provide information on their effect on the Ecological Network (undergo an Appropriate Assessment on the project level, in accordance to the Nature Protection Act), since the CBC Programme can only support activities that will not have any significantly adverse impact on the integrity and/or target features of the Ecological Network areas.

Given the character of the Programme, defines the priorities, measures and activities necessary for an affective Programme implementation in order to obtain the goals set out according to the situation/needs in the programme area, no alternatives were considered. Therefore the Appropriate Assessment focused on assessing potential impacts on the Ecological Network area and on proscribing

implementation criteria for all envisioned types of actions. These criteria will assist in future project selection so that the Programme implementation does not endanger Ecological Network areas and their target features.

7 RECOMMENDED MITIGATION AND ENHANCEMENT MEASURES

This chapter summarizes proposals for potential measures that can be deployed to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the programme as well as measures for enhancing positive impacts of the programme on environment. It integrates various recommendations formulated during assessment of consistency of the proposed programme with the relevant environmental protection objectives (Chapter 4), during assessments of its potential impacts on environment (Chapter 5), as also within appropriate assessment of impacts on Natura 2000 network (Chapter 6).

The proposed mitigation measures are meant as guidance for reducing environmental risks associated with proposed interventions and maximizing their positive impacts on the environment. This SEA report will be subject to consultations with relevant authorities which may further suggest to modify proposed recommendations. The SEA Report and obtained inputs must be considered by the Managing Authority before the final adoption of the proposed IPA CBC programme which can address recommendations provided through variety of means, including e.g.:

- Accepted recommendations can be directly incorporated into the programme itself - e.g. when defining the 'Examples of actions' to be supported or 'Specific territories targeted'.
- Proposed conditions for implementation can be used as requirements for project applicants (e.g. all projects that require EIA or assessment of impacts on Natura 2000 network must demonstrate that such assessments were conducted, infrastructural projects must have valid building permit and must meet applicable environmental standards, etc.)
- Recommendations for enhancing positive effects on the environment can be used during project selection for bonification of applications that achieve the desired positive impacts (e.g. bonification criteria can be established for project applications supporting eco-tourism, organic agriculture, resource reuse and recycling, contributing to the establishment or sustainable management of transboundary protected areas, increasing connectivity of ecosystems, etc.).
- Information generated within this SEA can be provided to prospective applicants for project support so that they are informed about any relevant recommendations and adjust project proposals to optimize their environmental performance.
- Recommendations provided within this SEA can be considered on *ad hoc* basis as an internal *aid memoir* during selection of project applications.
- Lastly, the Managing Authority for this programme can refuse recommendations on the basis of overriding economic concerns or if the proposed measures cannot be addressed within programme implementation modalities.

The main specific recommendations for proposed interventions generated within this SEA are summarized in the following sections.

7.1 Recommendations for implementation of activities within programme Specific Objective 1.1.

Type of measure	Recommendation
General (for all activities under this Specific Objective)	<p>Supported facilities for health and social services should be located in flood-safe areas and should be easily accessible in emergency situations (e.g. not be cut-off by floods).</p> <p>Development or modernization of buildings must meet all applicable environmental requirements and should ideally demonstrate good environmental building practices - e.g. easy accessibility for public transport, energy efficiency, sound waste collection, etc.</p>

7.2 Recommendations for implementation of activities within programme Specific Objective 2.1.

Type of measure	Recommendation
General (for all activities under this Specific Objective)	Supported infrastructural projects must be subject to applicable environmental standards and be subject - as and when needed - to applicable environmental impacts assessments, assessments of impacts on Natura 2000 network and possibly consultations on transboundary impacts (if such impacts are expected).
Specific - for joint actions in the area of monitoring and management of environmental and/or biodiversity protection	<p>Monitoring and management responses should focus specifically on priority issues addressed by the Danube River Basin Management Plan and the EU Strategy for the Danube Region (EUSDR) where more information is needed from the region: i.e. ecological and chemical status of water bodies, source of water pollution, ground-water pollution and accidental risk spots inventory, indigenous species (especially Danube sturgeon species), status of all species and habitats covered by EU nature legislation, and invasive species. Improvements of monitoring systems should primarily entail exchange of information and making it publicly available - new monitoring systems should be set up only when really needed. Monitoring system should be coordinated with bodies in charge of Danube River Basin Management Plan (i.e. ICPDR) - in terms of issues addressed, exact parameters monitored, using lessons from the Joint Danube Survey 3.</p> <p>Potential applications for environmental monitoring systems should be cross-verified with the relevant national authorities (e.g. State Institute for Nature Protection, Croatian Waters, etc.) in order to maximise potential synergies with higher-level monitoring systems on national or international levels. Monitoring parameters, periods, data collection methods, frequency and information formats should ideally allow the various monitoring systems to build on one another and fill in the priority information gaps. The data obtained should be shared with any interested institutions and made publicly available to allow their wider use.</p>
Specific - for actions related to environmental and biodiversity protection	The character of proposed activities within IPA CBC Croatia-Serbia programme offers a suitable framework for supporting range of initiatives related to this cross-border Biosphere Reserve, especially on the Serbian side which awaits formal designation and where implementation needs are

	<p>extensive given the large area involved. In this regard, pay increased attention to possible support to activities related to this Biosphere Reserve as long as they fit into logic of programme interventions and they demonstrate additionality to any ongoing projects that may be funded from other sources (EU, international or national).</p>
<p>Specific - for actions related to risk prevention systems</p>	<p>All supported activities on flood protection should promote a long-term flood protection and retention approach that respects the ecological processes in the flood plains. Priority attention should be given to actions that address the following six targets of the Action Programme for Sustainable Flood Protection in the Danube River Basin which follow the same logic and have been endorsed within the framework of the International Commission for Protection of Danube River - i.e:</p> <ul style="list-style-type: none"> • To reduce the adverse impact and the likelihood of floods in each sub-basin through the development and implementation of a long-term flood protection and retention strategy based on the enhancement of natural retention as far as possible • To improve flood forecasting and warning suited to local and regional needs as necessary. • To increase the capacity building and raise the level of preparedness of the organizations responsible for flood mitigation • To develop flood risk maps • To harmonize design criteria and safety regulations along and across border sections. • To prevent and mitigate pollution of water caused by floods. <p>Interventions on flood risks should be closely coordinated with Danube and Sava basin flood risk management plans and should also take into account potential impacts of climate change. Both of the proposed measures should ideally support implementation of Danube wide flood risk management plans due in 2015 under the Floods Directive. Alternately, should suitable application arise, priority consideration should be given to flood protection measures can support implementation of priority measures endorsed through ICPDR's Sub-Basin Level Flood Action Plan for Pannonian Southern Danube (2009) - i.e.:</p> <ul style="list-style-type: none"> • Spatial planning (Preparation of flood risk maps, Ensuring that spatial plans contain flood hazard maps, Defining limitations related to land use in flood prone areas). • Enhancing retention and detention capacities (Preserving - and where possible enhancing - existing capacities of natural flood retention capacities). • Non-structural preventive measures: (Introducing principles of EU Floods directive to decision-making, Capacity building of professionals, Raising awareness and preparedness of general public (Raise awareness and preparedness of general public). <p>As part of emergency preparedness and risk prevention systems consider also mapping of various flood risks and water pollution hazards in the flood zones in accordance with the EU Floods Directive as part of a single disaster risk prevention and management system.</p>

<p>Specific - for actions related to pilot and demonstration projects including innovative approaches to risk prevention and mitigation.</p>	<p>Supported measures must not restrict natural retention of flood plains - ideally should expand natural retention by e.g. promoting the 'room for river' approach that allows flooding during periods of high discharge.</p> <p>Consider adding establishment of protection forests amongst the types of eligible activities that can be supported.</p> <p>Flood prevention and drought protection projects should not be planned on locations where they will not have a negative impact on the Ecological Network target features or integrity.</p> <p>In case of support to irrigation, give preference to irrigation systems that do not require reservoir construction (especially not on the rivers) for their water source and that are not planned or already located within or in the vicinity of Ecological Network areas.</p>
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7.3 Recommendations for implementation of activities within programme Specific Objective 2.2.

Type of measure	Recommendation
<p>General (for all activities under this Specific Objective)</p>	<p>Priority support should be given to:</p> <ul style="list-style-type: none"> • energy efficiency measures in public buildings (such as hospitals, schools - where possible synergies with interventions under Thematic Priority 1 Employment, Social Inclusion, Health and Social services exist) • use of agricultural waste for energy production, • demonstration projects for solar power on roofs or build surfaces as long as they do not have adverse visual impacts on the amenity of landscape and cultural heritage. <p>Supported projects must be subject to applicable environmental and health protection standards and be subject (when needed) to: environmental impacts assessments, assessments of impacts on Natura 2000 network and consultations on transboundary impacts (if such impacts would be expected).</p>
<p>Specific - for actions related to joint studies and incentives to support the utilization of renewable energy resources and energy efficiency</p>	<p>Consider targeted support to elaboration of renewable energy plans for counties in the study area and their optimizing through SEA processes. Such plans may be helpful for guiding preparations of specific investment projects and they can simplify environmental permitting processes (if SEA is done well). Such plans, can also consider any possible transboundary impacts.</p> <p>Any larger-scale promotion of biomass farming should be permitted only if it can be proved that it will not lead to the deterioration of already achieved state of any water body surface and groundwater (which is e.g. a fourth objective of Croatian River Basin Management Plan). Biomass farming should not be supported on vulnerable areas under Nitrate Directive, unless the such project applications prove that the choice of crops and farming practice will not increase fertilizers and pesticides loads.</p>

Specific - for actions related to joint pilot projects on innovative technologies in the field of renewable energy and joint investing in public infrastructure on sustainable energy production and energy efficiency.	<p>Wind turbines and large solar parks should not be planned within areas important for bird preservation (Special Protection Areas, SPA).</p> <p>Large solar parks and hydropower plants should not be planned within areas important for preservation of species and habitat types (Special Areas of Conservation, SAC)</p> <p>It is recommended to finance smaller-scale solar power projects (use of several panels, rather than large parks). Solar parks should be limited to already built urban areas.</p>
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7.4 Recommendations for implementation of activities within programme Specific Objective 3.1.

Type of measure	Recommendation
General (for all activities under this Specific Objective)	<p>Ensure in the project preparatory phase, that no important and protected habitats and species (target features) are endangered by the planned infrastructure and activities.</p> <p>Preparation and development of joint tourism strategies and action plans should be subject to strategic environmental assessments (when their potential impacts would merit so).</p>
Specific - for actions related to tourism	<p>Consider prioritizing eco/agro-tourism projects that contribute to sustainable management of protected areas (e.g. walking and cycling paths, renovation of visitor centres, etc.) that have been prepared in cooperation with nature protection and culture protection authorities and adhere to the principles of EU Agenda for a sustainable and competitive European tourism such as: taking a holistic, integrated approach; planning for the long term; involving all stakeholders; recognizing, minimising and monitoring risks.</p>
Specific - for actions related preserving, restoring and reviving cultural, historical and natural heritage, including improving access to them; and small scale infrastructure related to cultural and natural heritage.	<p>The supported projects must meet all applicable national rules for cultural heritage protection.</p> <p>It is also recommended to inform prospective applicants about the following principles that should guide their planning of interventions for sustainable use of cultural and natural heritage:</p> <ul style="list-style-type: none"> • Conservation plans must contribute to the authenticity and integrity of the sites and monuments and their tangible and intangible elements. • Conservation plans must address all relevant factors necessary for adequate long-term safeguarding and sustainable use of the heritage site or monument. • The principal objectives of the conservation plans should be clearly stated. The proposals in the conservation plan must be articulated in a realistic fashion, from the legislative, financial and economic point of view, as well as with regard to the required standards and restrictions. • The conservation plans should aim at ensuring a harmonious relationship between the heritage sites and monuments and the surrounding environment as a whole. Wherever necessary for the

	<p>proper protection of the property, an adequate buffer zone should be provided.</p> <ul style="list-style-type: none"> • New functions and activities should be compatible with the character of the heritage sites and monuments. Proponents must ensure that such changes do not impact adversely on the outstanding value of the heritage site or monument. • Before any intervention, existing conditions in the area should be thoroughly documented. • Conservation planning should therefore encourage the active participation of the communities and stakeholders concerned with the property as necessary conditions to its sustainable protection, conservation, management and presentation.
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7.5 Recommendations for implementation of activities within programme Specific Objective 4.1.

Type of measure	Recommendation
General (for all activities under this Specific Objective)	<p>If suitable applications for programme support arise, consider prioritizing support business development opportunities related to smart growth - e.g.:</p> <ul style="list-style-type: none"> • producing and marketing organic agriculture products, • waste management and waste reuse (e.g. waste from electronic equipment), • water efficiency and water conservation systems; • water-efficient irrigation systems; • drought-resistant and other climate-resilient crops, etc.

8 MEASURES ENVISAGED CONCERNING MONITORING

Article 10 of the SEA Directive requires Member States to monitor the significant environmental effects of the implementation of plans and programmes in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action. It also states that in order to comply with this obligation, existing monitoring arrangements may be used if appropriate, with a view to avoiding duplication of monitoring.

We have considered whether any of the identified impacts requires a systemic monitoring and concluded that due to the absence of significant risks and uncertainties on the programme-wide level, there is no need for dedicated environmental monitoring system for the proposed IPA CBC programme Croatia-Serbia 2014-2020. The SEA provided recommendations for modification of initially proposed indicators for Specific Objectives 2.1 and 2.2 and - and there is no further need for additional indicators as all of these proposals were fully incorporated into the cooperation programme itself.

We have also evaluated applicability of the proposed programme indicators for collecting any relevant environmental data that would support other needs for improved monitoring. To this end, the actions on developing and implementing joint environmental management initiatives under the programme Specific Objective 2.1 may provide useful inputs to national or region-wide monitoring for purposes of biodiversity protection, water quality, flood risks and related hazards. In this regard, recommendation for cross-verification of proposed monitoring systems by the relevant national authorities (e.g. State Institute for Nature Protection, Croatian Waters, etc.) has been proposed for the Specific Objective 2.1 in order to maximise potential synergies with higher-level monitoring systems (see section 7.2 for details).

9 CONTENTS CONTROL SHEET

This SEA study contains all information required by the Annex I of the SEA Directive (2001/42/EC). The table below presents how the requirements of the SEA Directive were addressed in this SEA study.

Annex I of the SEA Directive	Addressed within this SEA Study
a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	Chapter 1
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Chapter 3
(c) the environmental characteristics of areas likely to be significantly affected;	Chapter 3
(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Chapter 3
(e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Chapter 4
(f) the likely significant effects(1) on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	Chapter 5
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Chapter 7
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Chapter 2
(i) a description of the measures envisaged concerning monitoring in accordance with Article 10;	Chapter 8
(j) a non-technical summary	Non-technical summary

The SEA Study also in its Chapter 6 presents appropriate assessment of implications of the proposed programme on the conservation objectives of Natura 2000 framework in accordance with the requirements of the Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC

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